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Then again, some
same thing about



Nobell Chem Revenue Potential

Product Portfolio Breakout

High Growth Markets	1989	1990	1991	1992
Medical Applications	15	25	40	60
Industrial Applications	30	39	46	51
Total	*45*	*64*	*86*	*111*
% of total	*55%*	*63%*	*68%*	*72%*
Mature Markets				
Defense Applications	36	38	40	42
% of total	*45%*	*37%*	*32%*	*28%*
Total Revenue	*81*	*102*	*126*	*15*

Nobell Chem

Report to the Board of Trustees

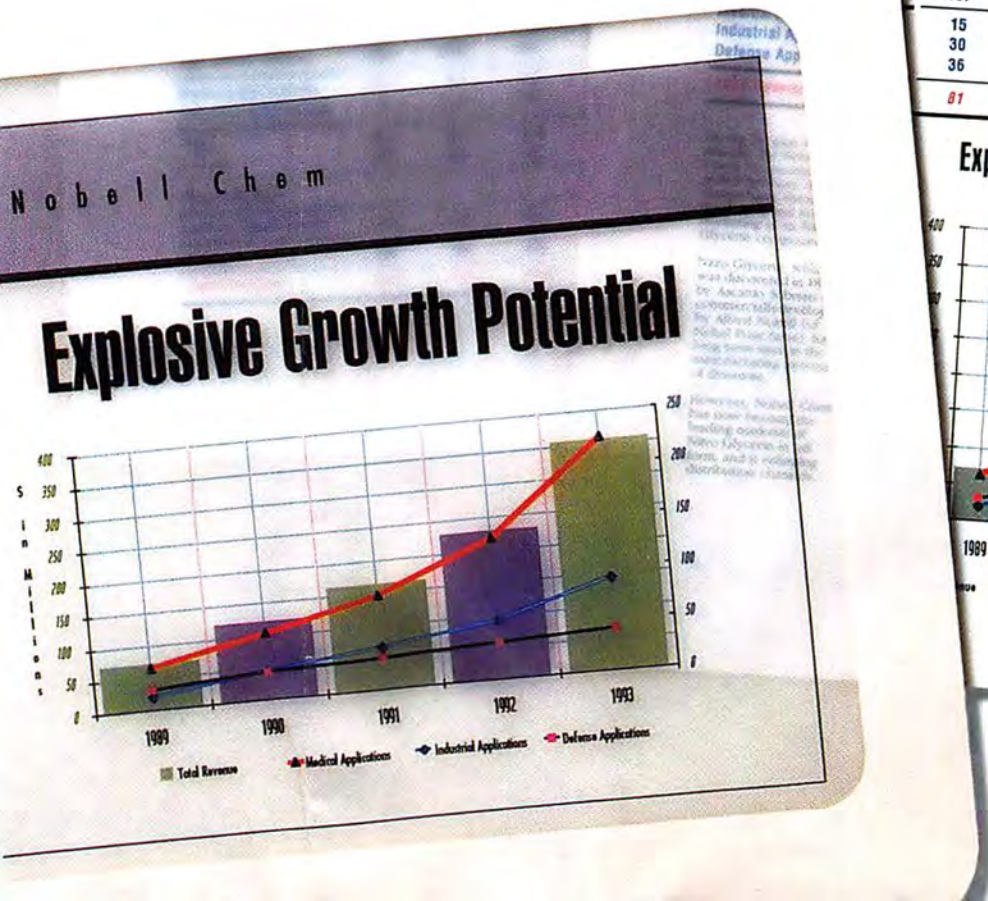
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…now become a leading marketer of Nitro Glycerin in pill form, to aid …l uses. As a result of this development, Nobell Chem is now expanding …istribution channels.

	1989	1990	1991	1992	1993
	15	25	40	60	85
	30	39	46	51	72
	36	38	40	42	44
	81	*102*	*126*	*153*	*201*

Explosive Growth Potential



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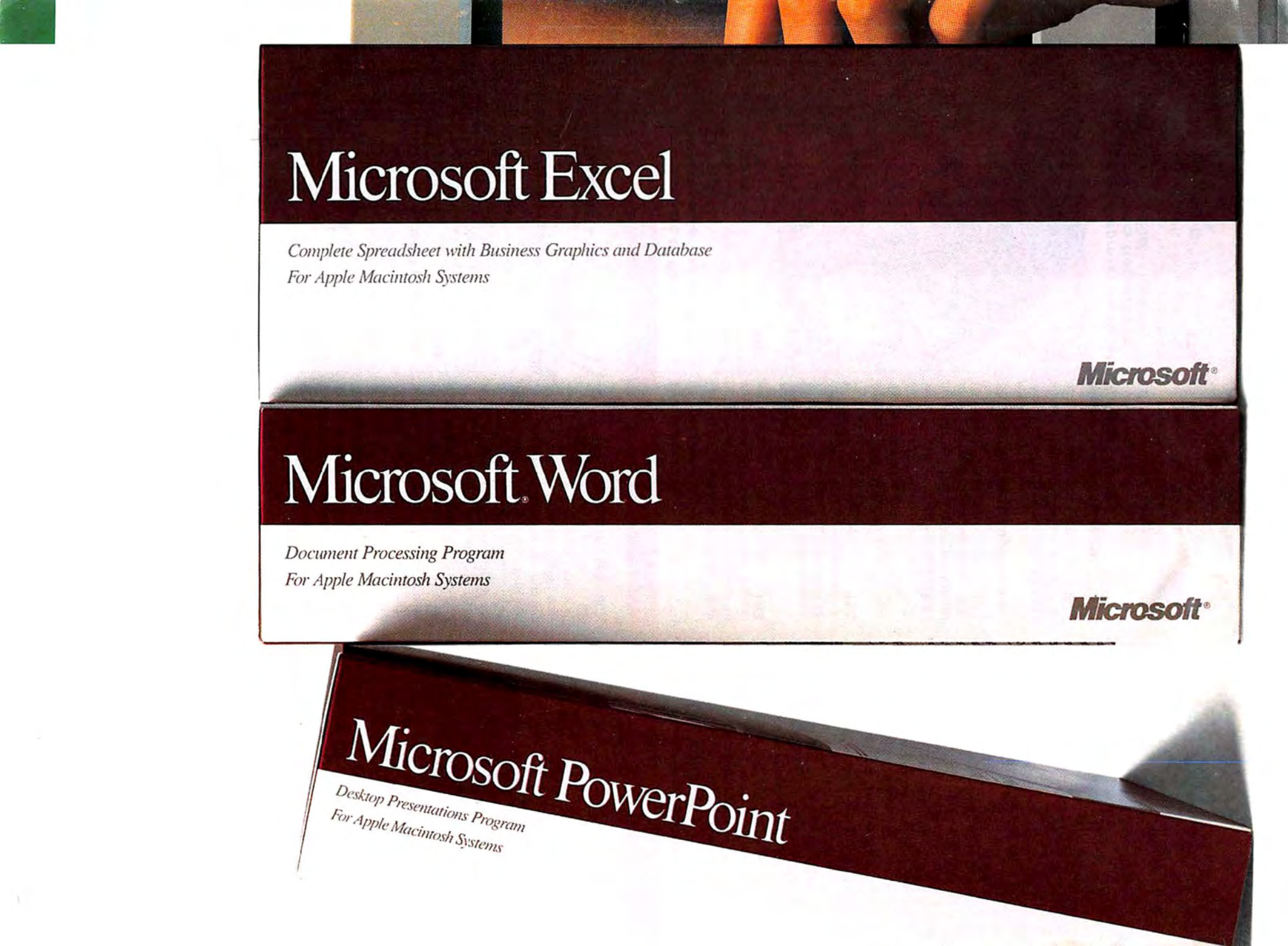
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StartUp

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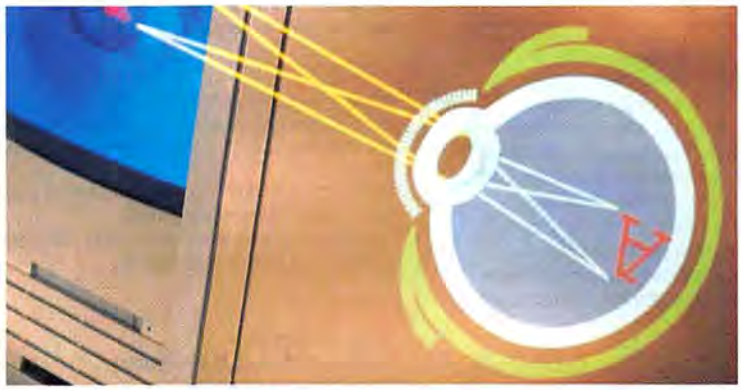




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BY PHILLIP ROBINSON AND THE MACUSER LABS STAFF

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Technical Difficulties and Help

Although we can't offer any telephone assistance, *MacUser* welcomes your technical questions. If you've got a Mac question or problem, send it to Help Folder, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. If we can't give you an answer, we'll find someone who can. Because of the volume of mail we receive, we can't answer all your questions, so we also recommend that you take advantage of your local user groups. You can find the one nearest you by calling Apple toll-free at (800) 538-9696, ext. 500.

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We love to get tips and hints (on a disk, please) from our readers. Any tips should be sent to Tip Sheet, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. We can't print every tip, but we try our best to pick the most interesting and representative ones for publication. We'd also like to hear from any programmers who are interested in contributing to our utilities disk series or labs-benchmark disk series. If you're interested, contact Michele Stokol at the address above.

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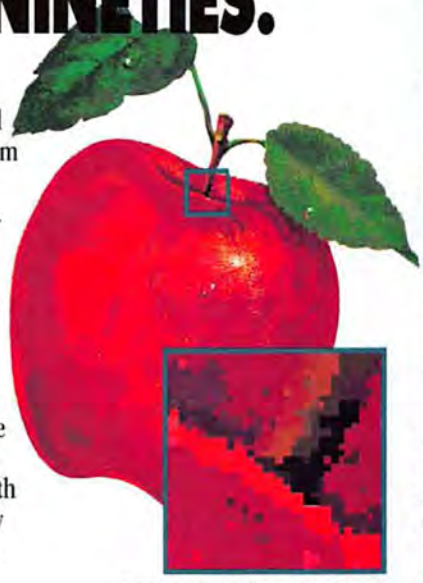
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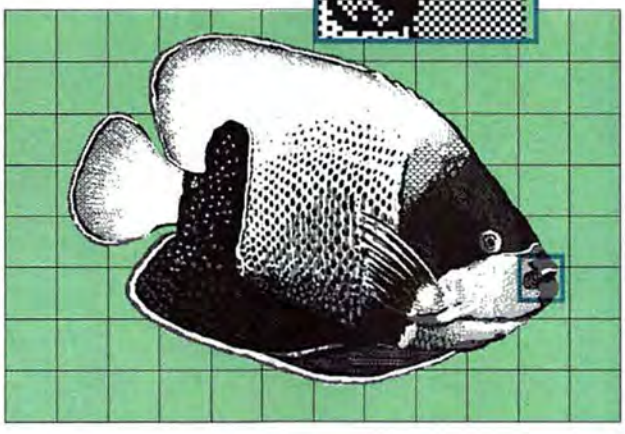
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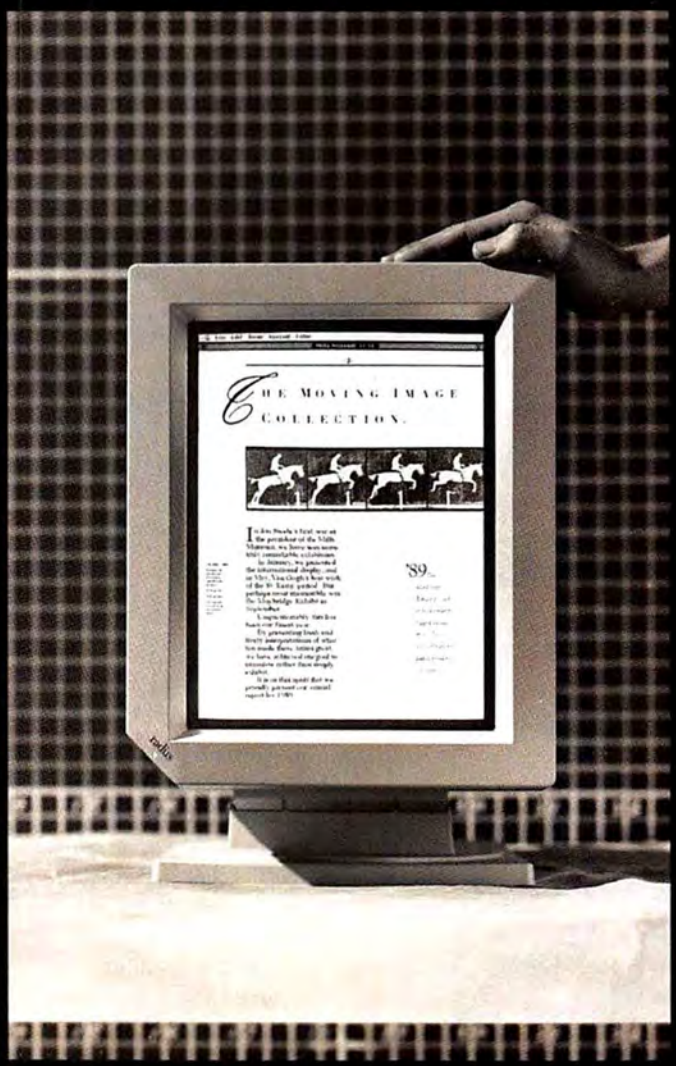
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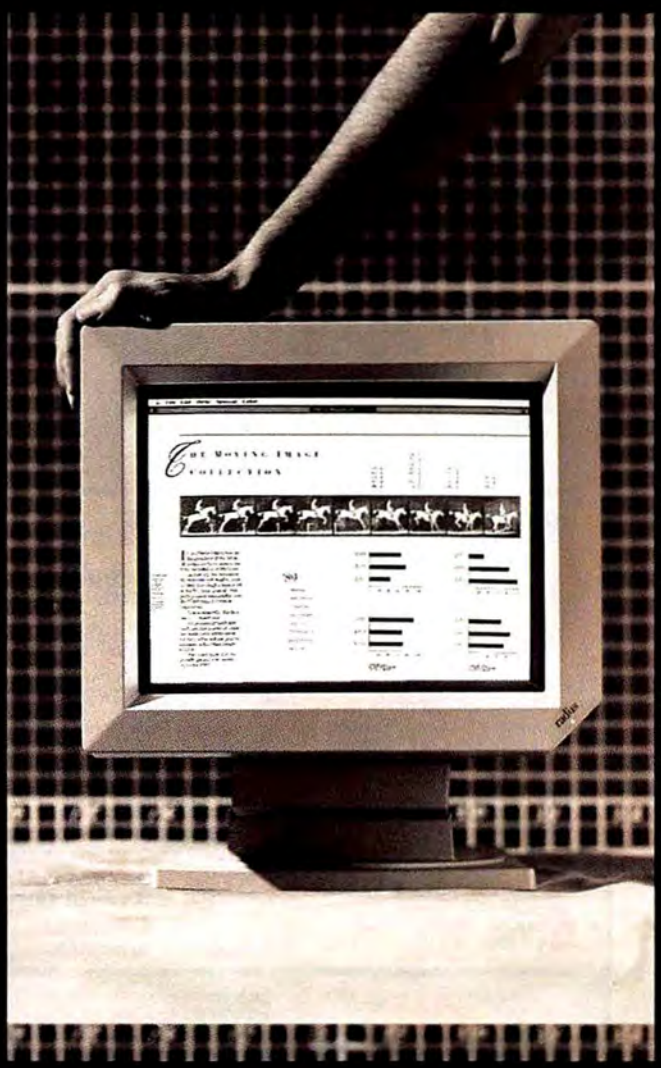


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When product vendors come to demo products to the *MacUser* editorial staff, they're often pleasantly surprised — and sometimes taken aback — by the number of tough questions they're bombarded with. "How come you guys ask so many questions? Nobody at the other magazines puts us on the spot like this"

Vendors may leave feeling as though they've just been through an IRS audit, but our hard-hitting questions benefit our readers *and* the vendors themselves. We don't settle for less than perfect. We dig to uncover bugs. And we ask vendors to add features we think users need. We all reap the reward when those features make an appearance in the next version of the product.



When MacUser NetWorkShop director Henry Bortman talked, Adobe listened.

One of the most feared — and most welcomed, depending on your point of view — tough-question posers is Henry Bortman, MacUser NetWorkShop director and a resident guru on everything from fonts to printers to PostScript to connectivity.

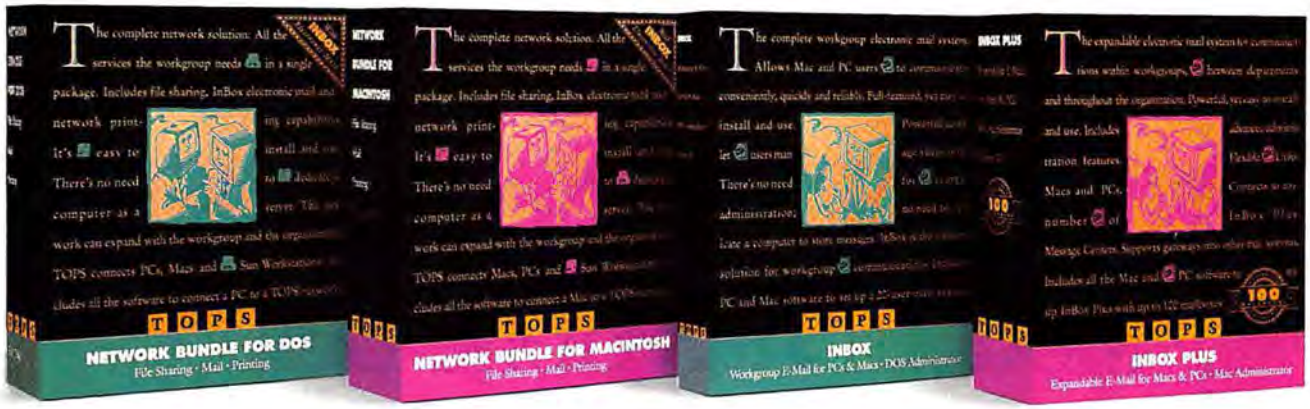
With his knack for cutting to the core of an issue, Henry is widely known as the Sam Donaldson of Mac press conferences. But although his pointed critiques can make rough going for the recipient, they can also pay off. Case in point: Henry's article "Font Woes" (January '90, page 245) took font makers to task for letting font menus get out of control. Here's what Henry had to say: "The Mac's handling of typeface selection is one of the most glaring examples of an interface that has outgrown its original design. The Font Manager is long overdue for an overhaul."

Of course, Henry did more than complain. He spelled out exactly how he thought font menus should work in a sane world and challenged Apple to do something about it.

We don't know if Apple was listening, but *somebody* was. Adobe's just-introduced Type Reunion utility was directly inspired by Henry's article: It organizes fonts according to family and weight and lets users choose font variants from a style menu. Just what Dr. Bortman ordered.

The Mac community has no shortage of critics, but there will never be enough original thinkers. *MacUser* editors such as Henry Bortman ask tough questions not just because we're interested in how good a new product or technology is — we want to know how good it *can* be. "The power to be your best" may have turned into something of a cliché, but we aren't ready to abandon the sentiment just yet.

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LETTERS

COMPILED BY JAMES BRADBURY

Low-End Lowdown

All this talk of a low-end Mac. . . . Do you realize you can get into a Mac Plus with a 30-megabyte hard drive for less than $2,000 if you shop right? How much more of a low end do you want? Go out and buy a low-end DOS machine, and I predict that inside of 90 days you'll wish that you'd spent that extra $500 to $1,000.

Matt Barkdull
Fairbanks, AK

Reader and Adviser

I was intrigued by Paul Somerson's predictions (April '90, page 23) and would like to add my own. Of course there will be more personal computers in the next ten years, but there will also be more confusion, more misuse, and more misunderstanding. As James Burke said, "Never before have so many people understood so much about so little."

The '90s will be the decade when we finally address the fact that, as far as computers are concerned, everyone is still in the dark. I don't mean we can't operate a computer, because we can certainly do that. The most important trend in computing in the next ten years will not be any new hardware or software. It will be a growing social capability to regulate our use of and dependency on technology.

When this happens, when we free ourselves from the mythology so many of us subscribe to, we'll see the first real personal computers.

Jim Everson
Phoenix, AZ

Shhhh!

I was happy that you reviewed CD-ROM discs ("CD-ROM Hit Parade," April '90, page 160). This particular technology is of great interest to those of us in the library field, who must frequently physically sift through large amounts of printed information to find the answers to clients' questions.

My advice to CD-ROM-disc publishers is this: It takes more than a rainbow-colored piece of plastic to make a useful CD-ROM database. Hypermedia doesn't just happen — talk to the researchers who are going to be using your product, and don't just dump the print version to disc and call it a day. The best CD-ROM disc I have seen so far is the Electronic Whole Earth Catalog: It is the standard by which publishers should be measuring themselves.

Jean Armour Polly
Liverpool Public Library
Liverpool, NY

Trillions and Trillions

I was disappointed to see our Knowledge Finder medical-literature-reference CD-ROM discs for the Mac were omitted from "CD-ROM Hit Parade" (April '90, page 160). They were some of the first discs to come to market, more than two years ago. Since then we've successfully delivered trillions of characters of data around the world. Clinicians, researchers, and educators in biomedicine now have access to a storehouse of knowledge that was previously inaccessible to them.

Lyndon S. Holmes, President
Aries Systems Corp.
Andover, MA

Swing, Swing, Swing

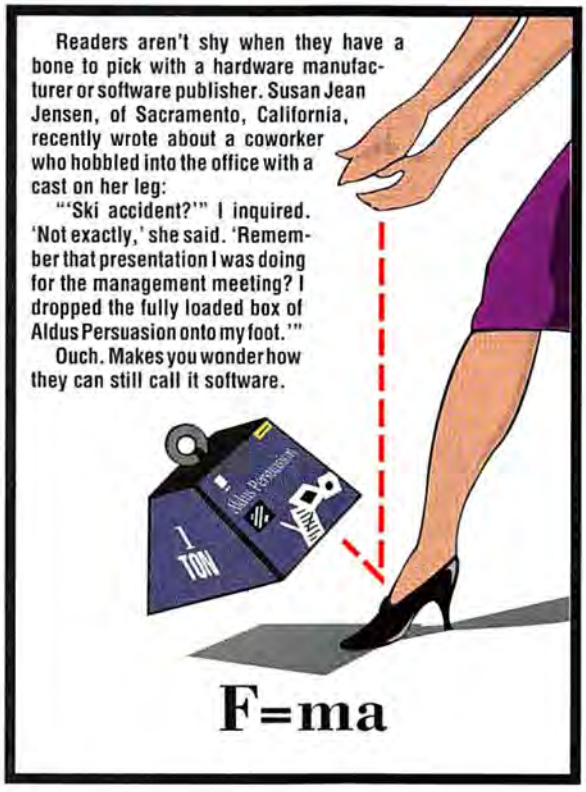
Thanks for your article "CD-ROM Hit Parade" (April '90, page 160). It couldn't have come at a better time. I'd just purchased an Apple CD-ROM player, and after I'd watched the demo that came with it a dozen times or so, it seemed that it might turn out to be the most expensive CD player I could have purchased. After all, did I really need the CD-ROM player just to listen to Benny Goodman at Carnegie Hall?

Paul Raymer
Las Vegas, NV

Hang on, the idea of buying a CD-ROM player for listening to jazz isn't that far-fetched. One of the projects that the folks at Voyager (of Beethoven's Ninth Symphony fame) have on the boards is a CD-ROM edition of The Smithsonian Collection of Classic Jazz. *— JB*

User Abuser

While I was looking through past issues, I discovered that I had missed a letter on page 20 of



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And some of the toughest critics of all, the editors of *MacUser* magazine, recently awarded CanOpener their prestigious Editors' Choice Award for Best File-Management Utility.

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LETTERS

the December '89 issue wherein the writer complained that he would have to pay another $110 for version 2 (on top of the $330 he'd paid for version 1 and a fix) of a software program.

He called himself a "supporter," as if that should bestow some benefits on him. In actuality, he is a "user." He used the program for a year and a half. And if he spends the $110 for version 2, he will have the new $300 program and have paid only $140 for the benefits of version 1 for that year and a half.

What does he want, perpetual free upgrades? If he doesn't want to pay for the programming that went into version 2, he should continue to "support" version 1.

Douglas Wells
Vienna, IL

Type for 2

Now that Adobe has loosed its algorithms on the world, and before Type 3 type becomes little more than a killer trivia question, I've gotta ask — was there such a thing as Type 2 type?

Patrick Atherton
Minneapolis, MN

Yes. — JB

Where's Entertainment

Glad to see that you've finally brought back my beloved MiniFinders. However, the first thing I looked for and, sadly, didn't find, was the Entertainment section. I had come to depend on that section and anxiously awaited the return of MiniFinders for just that feature.

Is the whole Mac community turning into a bunch of stuffed shirts with no time for a quick game of Tetris? I certainly hope not.

Kathy Puzzuto
San Bernardino, CA

Unfortunately, space limitations made it necessary to cut Entertainment, even though it's one of the most popular sections in MiniFinders. That doesn't mean it's impossible to get the information, though. The entire MiniFinders database, in HyperCard format, can be downloaded from Zmac, MacUser*'s new online service. — RI*

Feeling Exstatix

Thank you for your thorough review of our Mac statistical-analysis package Exstatix ("Business Statistics," April '90, page 114). Although your speed benchmarks were accurate for the version of Exstatix reviewed, your readers should be aware that we have since released a new version of the program (1.5) that now performs these computations up to four times faster. In addition, the new version automatically makes direct calls to the 68881 coprocessor for further increases in speed. Finally, the retail price of version 1.5 has been decreased to



Special Delivery...

... When we asked what people were waiting to buy when **the price is right** (April '90, page 12), people sent some lengthy lists of everything from modems to monitors. But a lot of people, such as computer educator Dave Squires, of Port Coquitlam, British Columbia, Canada, started out closer to home: "I strongly resent having to defend Apple's snobbish, expensive, and elitist marketing decisions to teachers, parents, and students who struggle to afford a Mac, while Apple sits with $900 million of *our* cash in the bank."

Joel McCoy, of Kelsterbach, West Germany, would like to see "a combination fax machine, laser printer, and full-page scanner. It will only be a short time until the Japanese blow away the fax and printer market by offering a combo unit at an affordable price." We *thought* the Japanese were looking to get into those markets. ...

Lots of you also mentioned scanners. Jay D. Eckert, of Seattle, Washington, will whip out his VISA card at $1,000: "The HP scanner has been advertised locally for $995, but it doesn't include the cable or the Mac interface, neither of which are discounted. Don't ask me about CD-ROM."

Remember Apple's famous featherweight-documentation ad? Ease of use is fine, but the "intuitive" way to do something isn't always the most efficient. How many people take years to figure out that clicking on a hard-disk drive's name in a directory dialog box moves you up through the hierarchy of folders?

Speak Up:

What didn't you know about using a Mac until long after you wish you had?

Send your thoughts to Special Delivery, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

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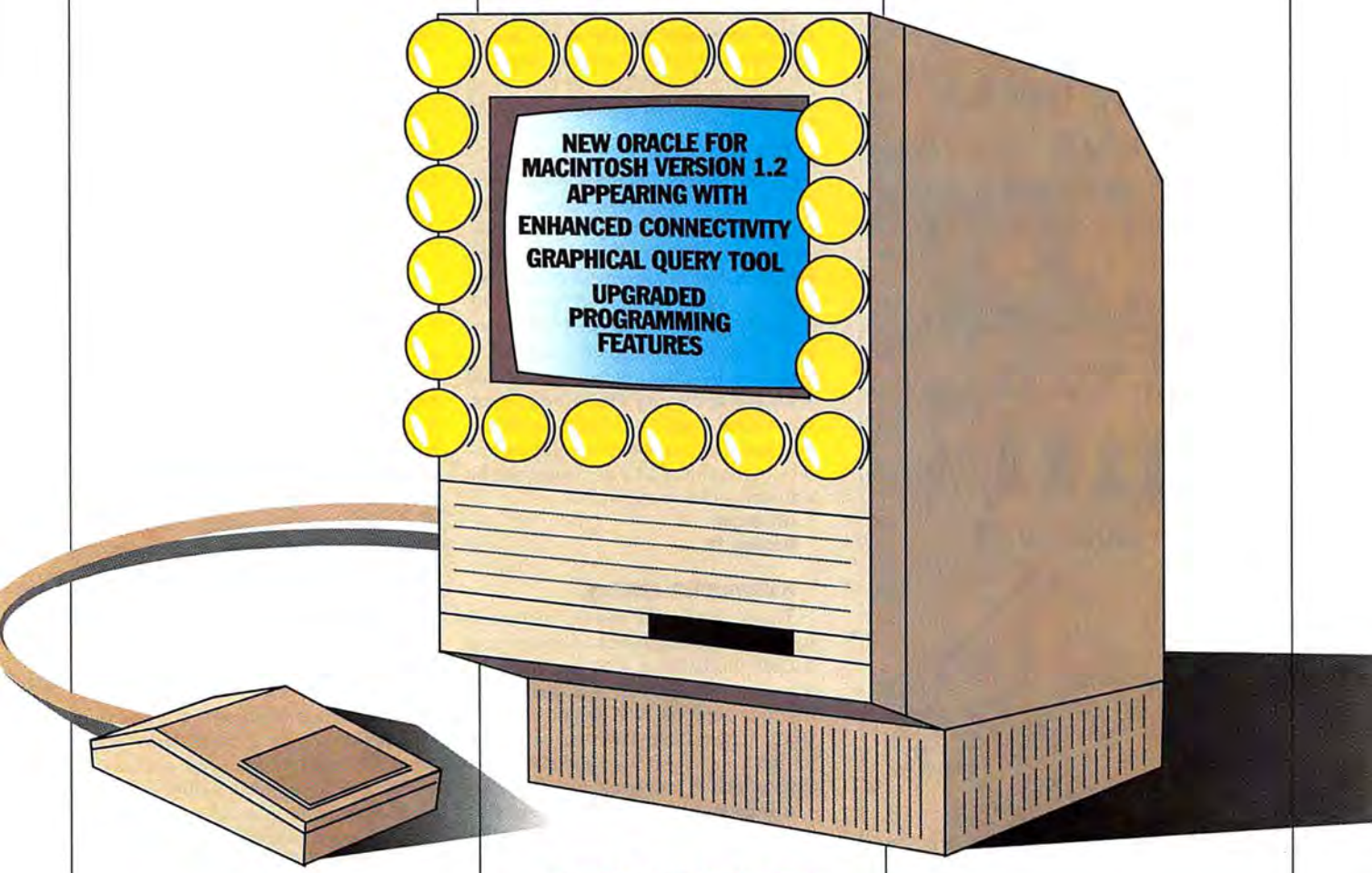
The new HyperCard-based Query Tool, with the enhanced Application Generator and System Stack, lets users point and click to query data and then automatically transfer it to their favorite programs such as Excel, Wingz or Word. All without knowing SQL or writing code.

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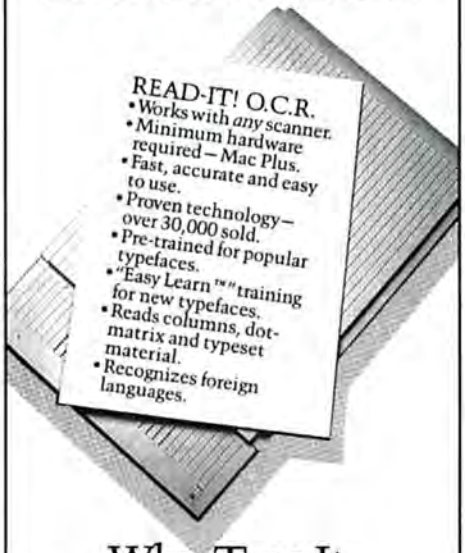


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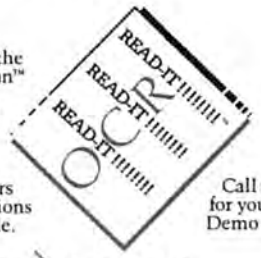
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LETTERS

$295, making it $200 to $495 less expensive than any of the other packages you reviewed.

Daryl L. Scott, Executive Vice President
Strategic Mapping, Inc.
San Jose, CA

Pricey Features

I really enjoy your magazine and read every issue straight through. I think your articles are informative and cover the subjects thoroughly without including too much confusing information that you don't really need.

But I have noticed a trend in the content. The feature articles have become more and more oriented toward what Mac products you can buy and which ones are the best. I know that not everyone can spend $500 a month on computer equipment, or even $250.

Jonathan Durkee
Sacramento, CA

Every month you'll find productivity as well as product articles in our pages. Check out our Power Tools and Solutions sections for information on how to do more with what you already own. — JZ

You Raskin You

In the name of the many people who have made the Mac a commercial reality, I would like to thank *MacUser* for presenting us with the John J. Anderson Distinguished Achievement Award (see "Editors' Choice Awards," March '90, page 92). When I first started the Macintosh project back in September 1979, even my most extravagant ideas could not match this reality. On the other hand, my original dream — to make the human interface become one of the primary issues in the choice of a computer and its software — has come true.

Jef Raskin
Pacifica, CA

A Rewarding Journey

Thank you for the wonderful John J. Anderson Distinguished Achievement Award. It is to Steve Jobs' credit that he was able to put together the unique, eclectic group of people who became the Mac Development Team. I was the messenger for the team, and it was (and still is) an extraordinarily powerful message.

It is particularly gratifying to see that the ultimate "greatness" of a product lies not in its clever advertising or persuasive public relations but in its ability to deliver better-than-average value to consumers. The marketplace understands this concept and continues to vote with its pocketbook.

We used to say, "The journey is the reward." As time passes, the true reward comes from seeing millions of people expanding their personal horizons by using a bunch of silicon and bits organized in a slightly better way.

Mike Murray
Redmond, WA

We hope Silicon Valley hears your message. These days, too many high-tech companies are employing more lawyers than engineers, and the overriding message is in danger of becoming "The jury *is the reward." — JZ*

Free for All

In the March issue, in the Editors' Choice Awards (page 92), you recommend a shareware program called Disinfectant 1.2 as an antiviral program. Could you tell me where I could write or call to obtain a copy of this program?

Martin R. Knapp
Lakeside, MT

Send a blank, formatted *floppy disk along with a self-addressed, stamped envelope to Disinfectant's author: John Norstad, Academic Computing and Network Services, Northwestern University, 2129 Sheridan Road, Evanston, IL 60208. — JB*

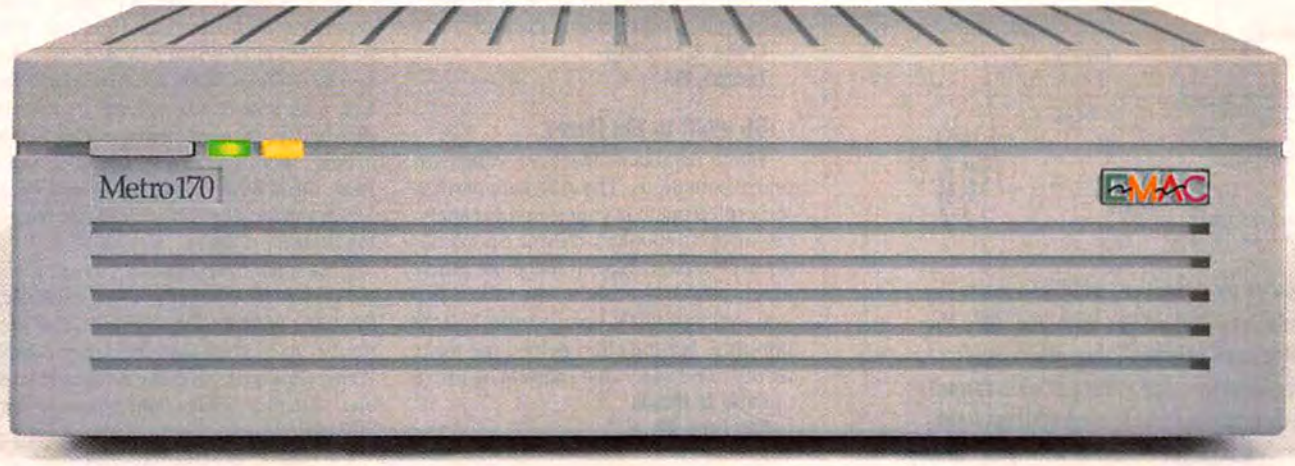
Jiminy Cricket Draw

I'm astonished that your April roundup of drawing programs ("Drawing the Line," page 92) omits Cricket Draw. I've found it superior to both MacDraw II and SuperPaint for my work — namely, making a variety of accurate drawings that are then imported into Microsoft Word documents. I used to despair when working with the "leading contender," MacDraw II, whose drawings fell to pieces when imported into Word.

John Sladek
Eden Prairie, MN

Although CA-Cricket Draw is indeed a drawing program that serves in many applications, it was omitted from the roundup for several reasons. CA-Cricket Draw is no longer a mainstream program. It has had no significant upgrades, and its PostScript functionality — basic capabilities, color breadth, and working speed — is overshadowed by that of Illustrator and FreeHand. If a graphics application can save graphics in EPSF, many applications can import and print them

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LETTERS

with all their original quality. This is not a unique ability of CA-Cricket Draw.

The other applications covered in the roundup are all established and evolving. They each have their niches and desirable traits, such as being handy DAs; are easy to learn; or are draw/paint capable. — SP

Expense Retort

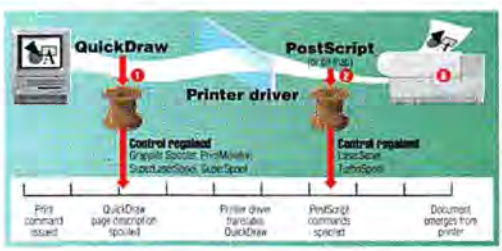
Political activism has no place in software reviews ("Time Is Money," April '90, page 147). Can your political-consultant reviewer really be serious about downgrading a program (Project Billing), which he admits "does everything you could want," just because it's too expensive? Please, let those of us in the marketplace make that decision!

Craige A. McMillan
Tacoma, WA

Straight to the Chart

I really appreciate *MacUser*'s diagrams and explanations. The case I am particularly referring to is your graphical analysis of print spoolers ("Print Spoolers," April '90, page 223). It made the article much clearer — this is not to say that your writing staff is being vague. Just the opposite, but the chart helped me make up my mind as to what I should be using.

David W. Hickok
Fair Oaks, CA



PrepSpool

I read with enthusiasm the article in the MacUser Labs Brief on print spoolers ("Print Spoolers," April '90, page 223). I do question one statement, however. The article said that when PrintMonitor senses a PageMaker document coming down the pike, it turns spooling off rather than get embroiled in the prep-file dilemma.

I use PrintMonitor, and it has always seemed to me that I regain control of the Mac when printing PageMaker files almost as fast as when I'm printing everything else. To test this theory, I printed a six-page PageMaker file that was full of text and graphics on my LaserWriter IISC. When I printed it with background printing, I regained control of the Mac in 35 seconds. When I printed it without turning on background printing, it took 2 minutes and 50 seconds before I regained control of the Mac. If PrintMonitor is not spooling my PageMaker file, then what is happening that would make this big time difference?

Could it be that my PageMaker files are not using the Aldus Prep file because my printer is not PostScript?

Terry Runé
Arvada, CO

You're right: The LaserWriter IISC doesn't use the Aldus Prep file. Aldus created Aldus Prep as an extension to the LaserPrep dictionary that Apple uses with its LaserWriter driver (the program that converts QuickDraw to PostScript) for use with PageMaker. This PostScript dictionary is used with a PostScript printer, such as a LaserWriter IINT. Since your LaserWriter IISC is a non-PostScript device, the Aldus Prep file has no function.

This same Prep file is the reason why many print spoolers choke on PageMaker files. It's unusual for an alternative dictionary to be used with the Apple LaserWriter, and most spooling programs must deal with that circumstance in some special way.

SuperLaserSpool solves the problem by forcing PageMaker to redirect the PostScript file to disk; then it downloads that file to the printer (which is why it is so slow for PageMaker).

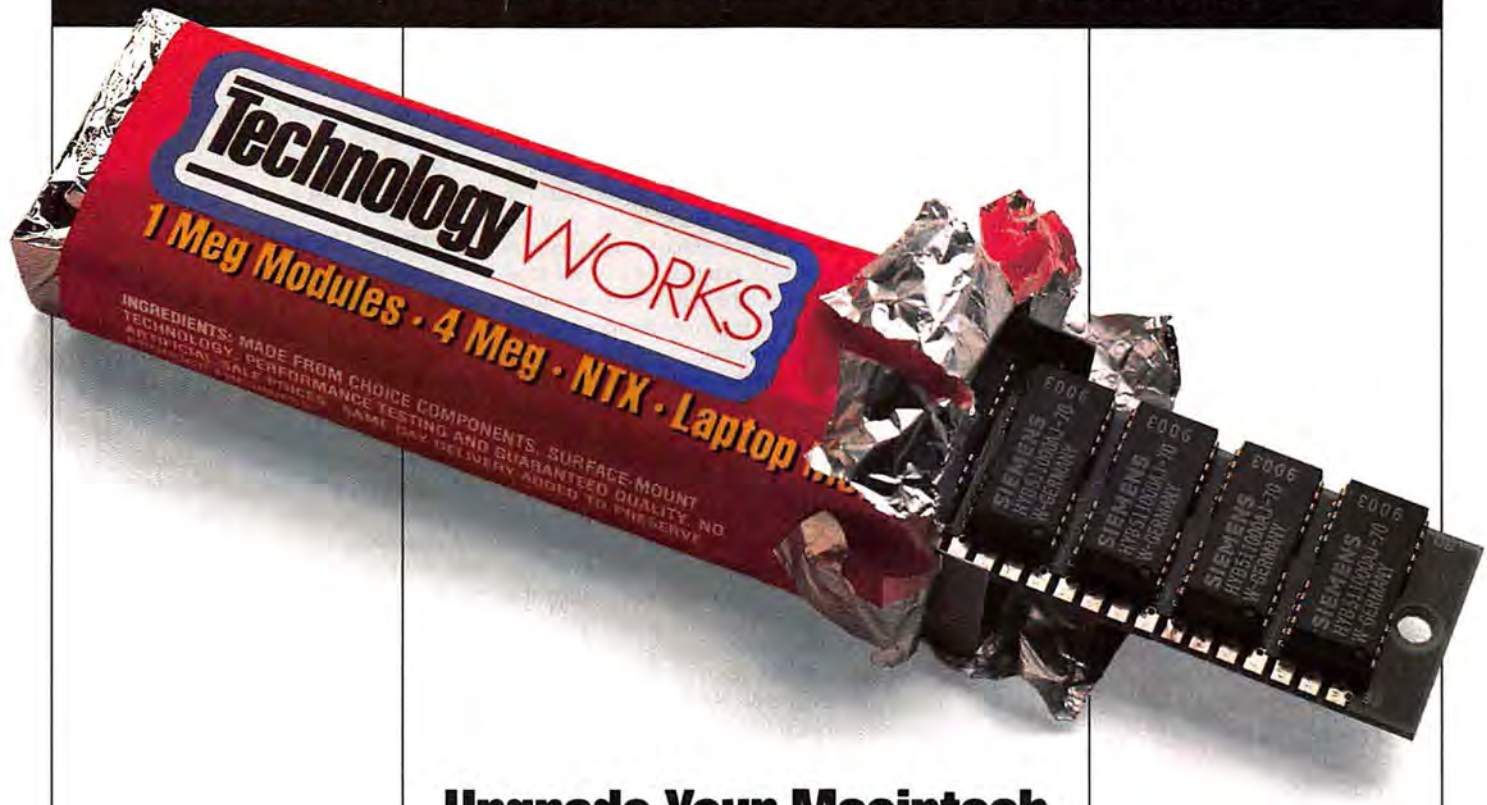
TurboSpool and TOPS Spool create a PostScript file regardless but require you to manually download the Aldus Prep dictionary to your printer the first time you spool a file.

PrintMonitor ignores PageMaker's foibles completely by passing a PageMaker document to the printer without spooling at all. — PF

I'm not much of a fan of PrintMonitor, but you gave it the short end of the stick in your recent review of print spoolers. First, PrintMonitor *does* work with the LaserWriter driver 6.0. If you obtained the LaserWriter driver 6.0 on Apple's color disk, you also got version 1.3 of PrintMonitor.

Second, PrintMonitor will notify you

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The Original Developer of StuffIt Deluxe Died in 3712 B.C.



We'll let others argue over who invented which idea. We at Aladdin Systems know exactly where the inspiration for StuffIt Deluxe™ comes from.

The ancient Chinese.

The Chinese language compresses words and phrases into simple pictorial characters. StuffIt Deluxe does the same to entire Macintosh files.

Huge files that once took up 1 megabyte of space now occupy as little as 16K. With StuffIt Deluxe, limited space is history.[1,2]

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1 For those already familiar with the ever popular StuffIt,™ StuffIt Deluxe adds over 75 new features, including complete archive management (sorting, multiple windows, Finder like operation, etc.), improved password protection, variable compression methods, scripting, virus detection, and one step QuickStuff/QuickUnStuff menus. Added bonus: TwoViewIt™ brand viewers. Call us for more info.

2 For the record, Raymond Lau, the modern-day inventor of StuffIt Deluxe, is alive and well and believed living somewhere on the East Coast.

StuffIt is a trademark of Raymond Lau. StuffIt Deluxe is a trademark of Aladdin Systems, Inc. and Raymond Lau.

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LETTERS

of a printing problem if you want it to. When PrintMonitor is open, simply select Preferences from the menu, and you'll see a dialog box that has preferences for the PrintMonitor window as well as choices for how it should inform you of problems with printing or manual-feed jobs. You have the choice of no warning, a blinking Apple logo on the menu bar, or a work interruption.

Also, why didn't you review the TOPS spooler? I imagine there are enough people who use it or at least have the option of using it for it to merit a review, and I think it's pretty good.

I find that PrintMonitor tends to steal too many cycles from the machine, and I generally prefer the TOPS spooler because I usually don't even realize it's running.

Anthony R. Kenck
Coral Gables, FL

At press time, Apple hadn't officially released the LaserWriter driver 6.0 to the general public, so we couldn't run results based on what might not have been considered a "finished" product. We did note at the bottom of the features chart that the LaserWriter driver 6.0 would be supported in a future upgrade.

Regarding the TOPS spooler, we chose not to review it for two reasons. First, you cannot purchase it as a stand-alone product — you must purchase it bundled with TOPS networking software. Second, the software is identical in function to TurboSpool, except that TOPS Spool 1.81 currently supports the LaserWriter driver 6.0. If you're interested in the speed and performance of TOPS Spool, refer to the chart for TurboSpool. — PF

Your article regarding print spoolers addresses many of the concerns most users have about such software. I recently purchased SuperSpool and subsequently removed it from my system within a matter of days. Your readers with older machines (mine is a Plus with 2.5 megabytes of RAM) may find its sluggish operation as exasperating as I did. I have no idea how well print spoolers work with the newer machines, but it is clear that they have a long way to go with older ones.

What spooler developers really need to address is the capability of printing from several printers simultaneously. How terrific it would be to have one printer printing envelopes or labels while another is printing letters. *That* would make print spoolers really worthwhile applications!

Steve Baird
Baton Rouge, LA

Jasmine Chapter 11

Your "101 Hard Drives" review (February '90, page 153) was by far the most comprehensive synopsis of the external hard-disk-drive menagerie. Comprehensive with the exception of one factor: company stability!

Your review provided me with that final ounce of initiative to purchase a hard-disk drive. In the the 40-megabyte category, the capsule review recommended three drives, one of which was the Jasmine DirectDrive 40, so I ordered one.

A month later, I called Jasmine, but all I got was a short recorded message that stated that it had filed for bankruptcy under Chapter 11. And if that wasn't enough, the company had already charged my credit card.

From an engineering perspective, Jasmine might have *had* a quality product, and the review was probably accurate when it was performed. But the actual hardware represents only part of the picture — company stability and commitment to customers is another. My heart goes out to those individuals who already own a Jasmine product — whom are they going to call when they need product support?

Ted F. Bowlds
Burke, VA

You're quite right — from an engineering perspective, Jasmine had a quality product. However, MacUser Lab reports are not intended to report on the financial stability of companies nor, unless specifically mentioned, on customer support. That said, at press time we had no way of knowing that Jasmine would seek bankruptcy protection under Chapter 11.

We work hard to make lab reports both fair and objective — mostly because our readers depend on them for accurate information but also because if they're done shoddily, they can be seriously detrimental to small, struggling companies.

We couldn't speculate in print about the financial stability of one company without thoroughly investigating the affairs of not only that company but also of every other company in the report. That's simply not feasible when you're

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Software Compatibility: Exports to SYLK, Text, Excel,® HyperCard,™ and MacInTax.
Hardware Compatibility: All Macintoshes with at least 512K RAM. Works with your printer and monitor; we guarantee it.
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LETTERS

doing in-depth testing of more than 100 hard-disk drives.

If you're planning to buy a big-ticket item through mail order, though, you can cut your risks. One of the best ways is to tap into the combined expertise of the Mac community through on-line services such as our own Zmac. A message posted in an on-line forum will produce a flurry of opinions on any product or company.

As for Jasmine owners who've been left without support, one resource is an on-line technical document that was created by the tech-support team at Jasmine. You can download it from our Zmac on-line service. (For more information on Zmac, see "On the Line with MacUser*" in this issue). — AE*

Uncommon Marketer

I've just read and framed John Dvorak's criticism of marketing types! ("A Mark[et]ed Man," March '90, page 292). Here's my perspective — both engineering and marketing are needed for the best product success. Remember it was a "marketing guy" who developed the Mac: Jobs. And it was another "marketing type" who reworked the power/memory to appeal to corporate America: Sculley.

A "marketing guy" would never have developed MS-DOS. I rest my case.

David Keenan, V.P., Marketing
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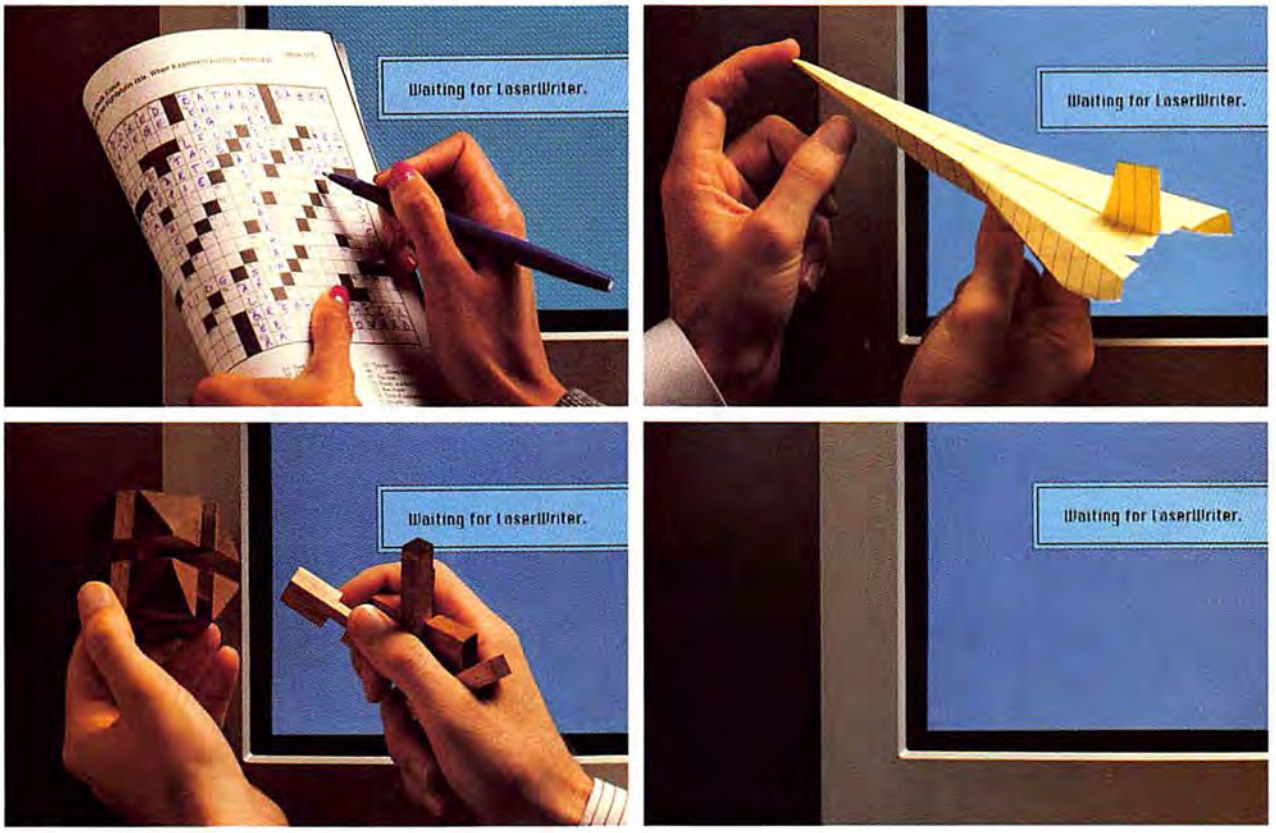
If you write one, we will. The best place to post one is on Zmac, which has already been thoroughly plugged in this Letters section. — JB

CLARIFICATIONS

J. Lawrence Enterprises, Inc., distributor of the limited-edition Ishido, has set a retail price of $295 — substantially lower than the list price set by the game's publisher, Publishing International (and cited in our May '90 review of Ishido, page 71). Only 1,000 signed copies of the four-disk game were made available.

The price for Image Grabber was listed incorrectly in Bobker's Dozen (May '90, page 38.) The correct price is $49.

Idle Macs Are The Devil's Playground.

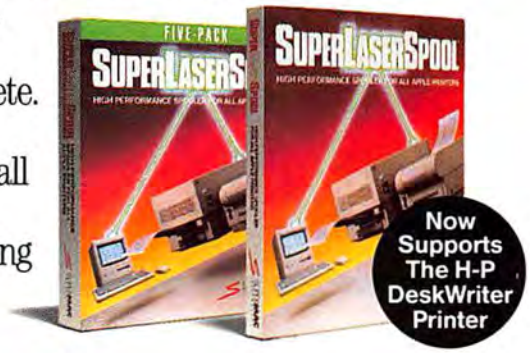


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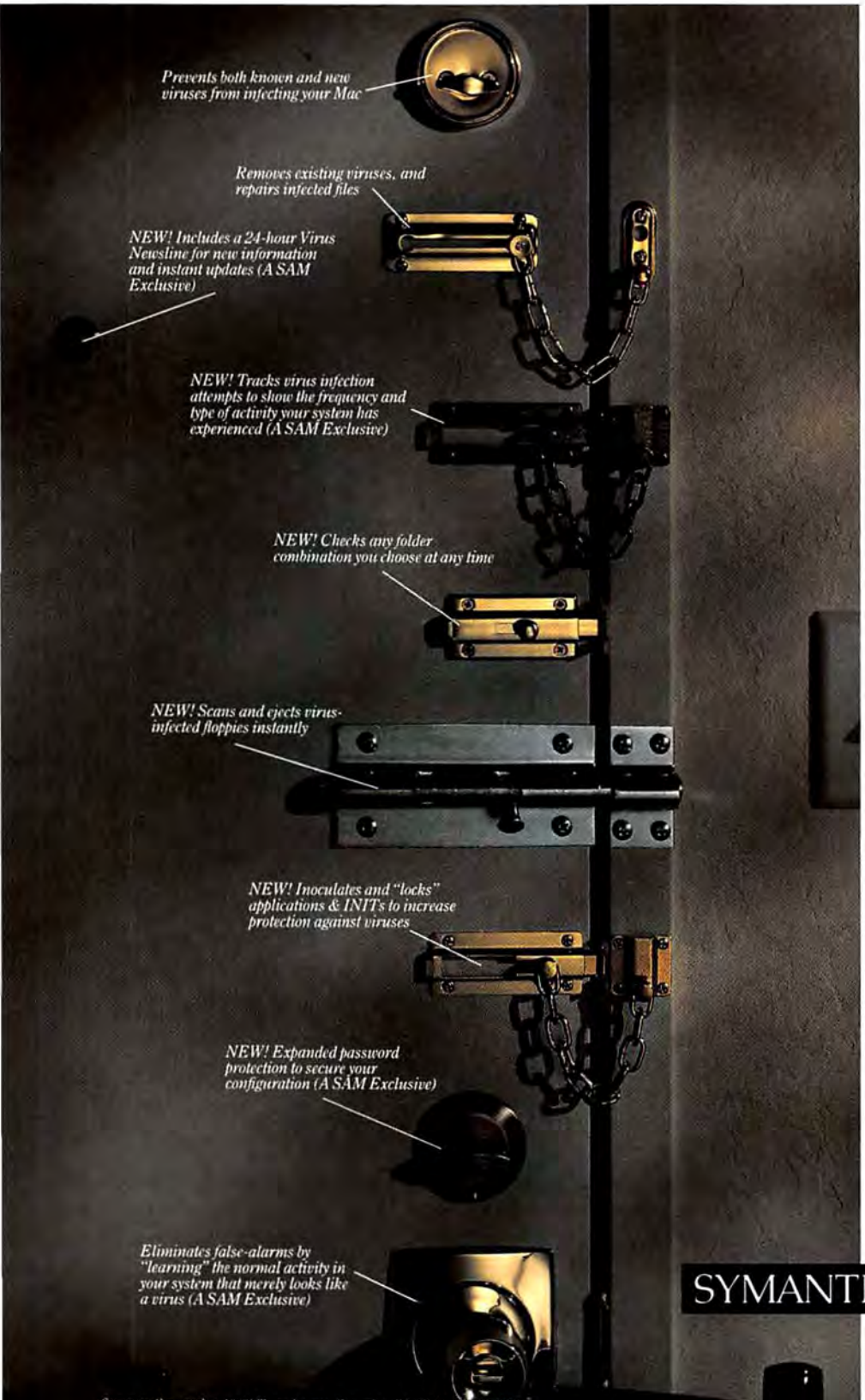
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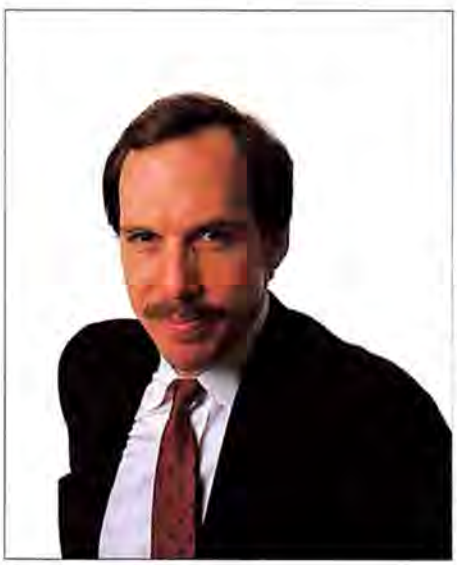
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PAUL
SOMERSON

More Power to You



By Paul Somerson

On a recent flight west, I sat in front of two yoyos in nearly identical yellow power ties, guys who looked as if they burned rain forests and put Gordon Gekko quotes on their office walls and spoke about Van Gogh paintings not in terms of color or form or texture but of how much they were likely to fetch in Tokyo.

Somewhere over Nebraska, the two started going at it heatedly over "time and space." A bit surprised, I tuned into the conversation, wondering if they were referring to some Einsteinian thought experiment. Turned out they were debating the profits in television versus print ad sales. Further into the flight, my journalist ears perked up when they began talking magazines and clips. A few sentences further into the conversation, I realized they were discussing guns.

Things aren't always what they seem.

Here's another example: We get a good deal of feedback about each issue. Last week I received a phone call from someone who wanted to talk about the magazine. Well, not exactly "talk." Fulminate is more like it. The staffer who forwarded the call to me explained that it was about our technical section.

MacUser readers are an extremely knowledgeable group; they can hold their own in any technical discussion and are the most savvy power users in the industry.

Not this caller. He reminded me of someone who sits behind you in a funny movie and laughs in all the wrong places. Or the type who signs up for a magazine with no intention of reading it, just so he can write a nasty letter to the editor and cancel his subscription.

"I was looking at a friend's copy," the caller began, "and I couldn't believe it. You filled the whole back of the issue with a story on . . . programming!" He chewed dyspeptically on every syllable like a televangelist pronouncing the word *subpoena*.

I started to answer, but he plunged on. "Nobody cares about programming! What you should be running is lots of articles for beginners. Programming stories belong in . . . DOS magazines." The word *DOS* was delivered with the special contempt most people reserve for child-beaters or congressmen.

I wanted to find out more about this caller. "Are you a reader? And what kind of Mac do you use?"

"No, I don't read your magazine. And, no, I don't have a Mac yet, but I'm right on the verge of getting one. Just as soon as they come down in price." And — click — he was gone.

MacUser never was a "beginners' magazine" and never will be. While it's true that nobody can be an absolute expert in every area, all industries have a core group of users who know the system inside out. This top layer of expertise drives the industry. Power users such as these are the ones who know which products to buy and why, how to set up and troubleshoot everything, and how to wring the maximum horsepower out of every system.

At the other end of the scale, casual and beginning users who want a little hand-holding are drawn to publications that are easy — warm, fuzzy, and soft.

But serious business users who need to know which products to buy and how best to use them require something with a lot more punch.

Fine. But why do we run pieces on programming?

To understand the answer, you have to understand the question. And the question is a bit like asking, "Why do you run pieces on spreadsheets? Aren't those just for bean counters?" Long ago (circa 1980), spreadsheet programs were strictly an arcane tool for accountants. Now they're a mainstay of every businessperson's repertoire. And the reason that happened is that several bright people (such as Bob Frankston, Dan Bricklin, and Mitch Kapor) realized that, with a personal computer, the spreadsheet metaphor could easily be *programmed* to reflect a single user's what-if questions.

Here's another question: "Why do you run pieces on word processing? Aren't those just for writers?" It's a question that might have made sense in 1980. But in 1990, the question isn't just rhetorical; it's ludicrous — writing is a part of practically everyone's job, and the many word processors available for the Mac make that job immeasurably easier. And one big reason why is because they can be *programmed*. When you check off your preferences in Microsoft Word and define a few new styles, you're programming your very own customized word processor. With a few clicks of the mouse, you're performing a programming job that used to be mammoth enough to keep a bevy of programmers busy for weeks on end.

The same thing for database programs, page-layout programs, utilities, and so on. In other words, the reason we write about programming is because virtually everyone who uses a Mac *is* a programmer — although only a few would cite it on their 1040 under Occupation.

Virtually everyone who uses a Macintosh *is* a programmer — even though only a few would cite it as their occupation.

Here's a partial list of things that you already know (or ought to know) how to program on the Macintosh:

• **The Control Panel:** Armed with a few cdevs, the Control Panel is like a mini object-oriented-programming environment. Check a few boxes, and you've customized your system.

• **ResEdit:** Thanks to the modular nature of the Mac's system software, you can use this little gem to switch a host of features on and off that control the all-important look and feel of your Mac.

• **PostScript:** Every time you send a PostScript document to the printer, you're actually downloading a little program. If you learn a bit of the language (as we'll be showing you in an upcoming issue), you can speak to the printer directly.

• **Telecommunications:** Any Hayes-compatible modem uses a programming language to control the flow of data. Most people rely on default settings in their telecom software, but a little exploration can pay off with improved throughput, and that translates into faster transmission and lower phone bills.

• **MacroMaker:** As most of you know, macros are basically miniprograms consisting of sequences of keystrokes and mouse clicks to be recorded, stored, and played back on demand. Lots of application software — such as spreadsheet programs and telecom software — has macro capabilities (often called something like a Watch Me feature), and there are several stand-alone macro-creating packages. MacroMaker is free, as part of the system software.

• **HyperCard:** Most power users have experimented with Apple's entry-level general-purpose programming tool.

• **System 7:** The Mac is the hands-down best user platform on the market; good solid custom programming can make it even better. Apple clearly believes in the power of programming and is building tools and hooks into future System releases to facilitate this. AppleEvents — part of the forthcoming System 7 — will open things up dramatically and become the first truly enabling technology for user scripting.

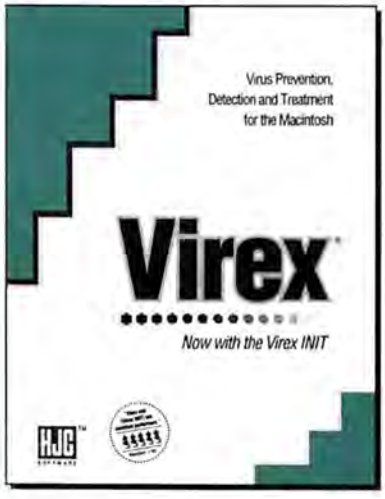
It's already starting to happen. Any company that seriously wants to kick performance into high gear will need Mac programmers to hot-rod things and fill in the gaps — if it doesn't already have a programmer or two on-staff.

This doesn't mean that everyone will suddenly have to learn the intricacies of Pascal or C. Program generators, advanced versions of scripting languages built in to future applications, and AI-based programming tools will all help pour on the power.

So, if you're still asking why we run programming pieces, it's because programming is the power in power user. It's the power in our own Power Tools section. And putting power into the hands of individual users is what it's all about.

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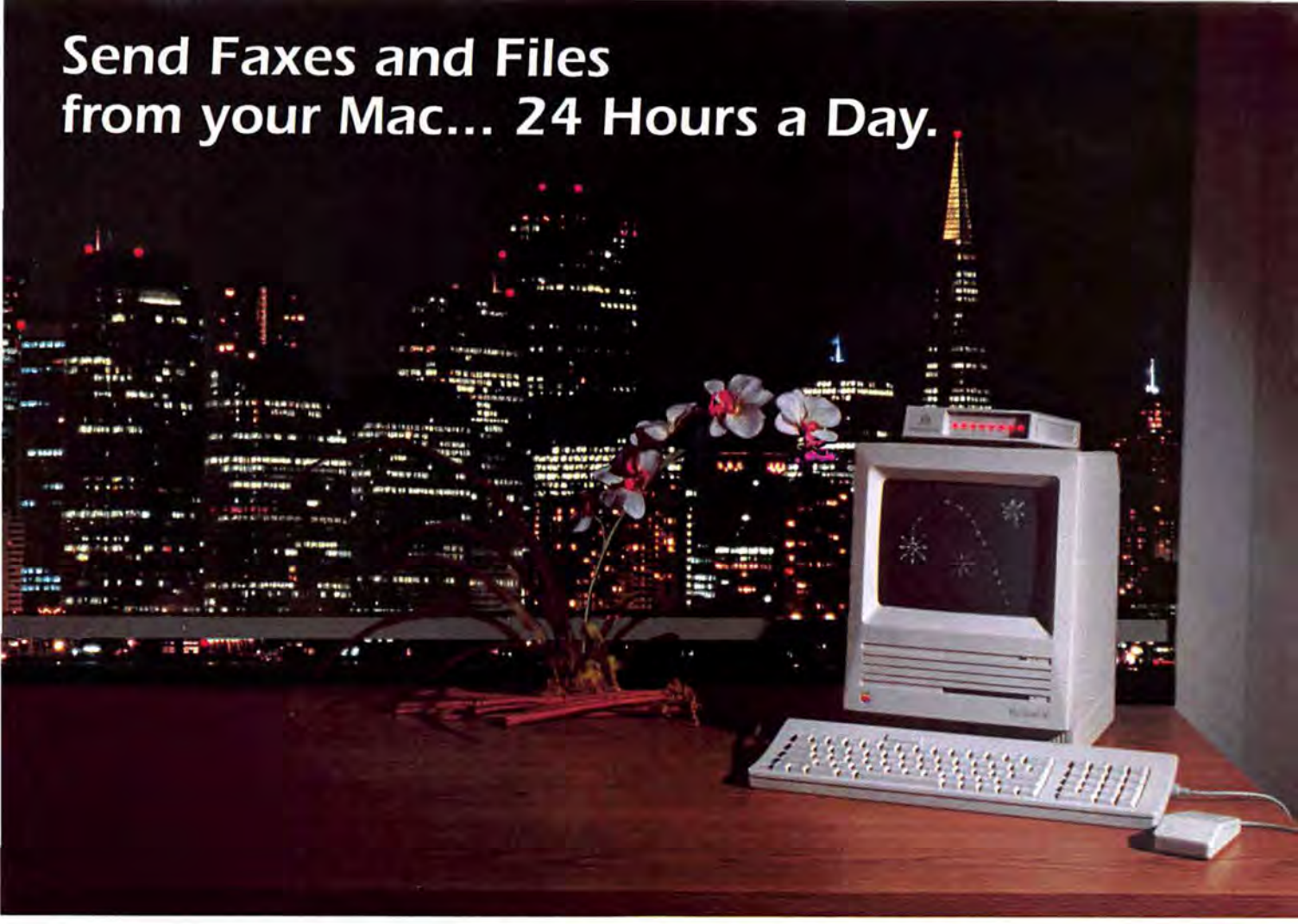
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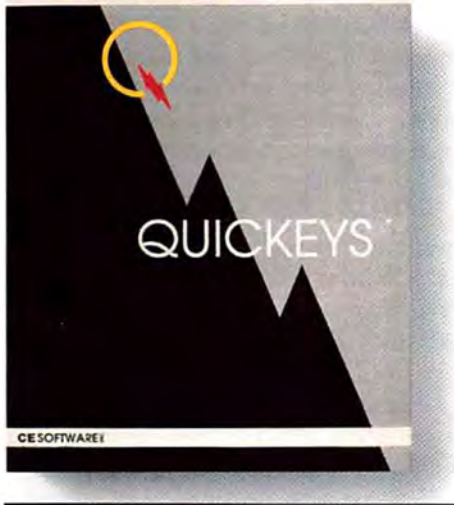
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ROBERT R.
WIGGINS

The 7.0 Deadly Sins



During the first half of 1990, Apple employees and Apple watchers lost confidence in both Apple and Apple's future. Oh, there were occasional bright moments, such as the rollout of the Mac IIfx at an aggressive price and the long-overdue announcement of a one-year warranty, but the overall picture was bleak. Layoffs, internal power struggles, delays and more delays in System 7.0, and a general lack of focus combined to make Apple a less pleasant place to work — and less fun to watch. Apple continued its profit-maximization strategies at what many — mainly third-party developers — felt was the expense of increased market share.

The message that seemed to be coming through loud and clear was that Apple didn't care about its employees, its developers, or even its customers. All Apple seemed to care about was the bottom line.

How did the mighty Apple, center of the microcomputer revolution and legendary folk company, come to be perceived as even more money-hungry and less caring than its monolithic, behemoth competitor, IBM? Many theories have been proposed for this reversal, from blaming everything on Steve Jobs, to blaming everything on John Sculley, to — more recently — blaming everything on Jean-Louis Gassée. But if you look way back to some classic behavioral theory, namely the infamous seven deadly sins, you'll find that Apple has just succumbed to the same lures that have plagued humanity for thousands of years.

1. Pride. Although some might call it arrogance, Apple's attempts to wrest the trademark on the word *Apple* away from England's Apple Corps (the Beatles' company) is an extraordinary example of pride, not to mention overzealousness on the part of its lawyers. In case you don't know the story: It seems that long, long ago, the two Steves made a secret agreement with Apple Corps for the use of the Apple name. One of the provisions of this agreement was that Apple Computer would never get into the music business. But when Apple brought out its MIDI interface and CD-ROM drive, Apple Corps felt the agreement had been breached. But rather than negotiate a new agreement, Apple's lawyers went to court in Europe to try to have Apple Corps' trademarks ruled invalid so that Apple Computer could then trademark *Apple* itself. Apple lost and managed to irritate the normally laid-back Apple Corps to the point that Apple Corps could end up forcing Apple to change *its* name, which would be an expensive lesson in pride indeed.

2. Sloth. A company with almost $1 billion in cash that uses a momentary drop in profits as an excuse to cashier hundreds of loyal employees is clearly interested in the shortest possible path to increased profits with the minimal amount of work and with a total lack of concern for who gets hurt in the process. What makes this all the more amazing is that Apple's employees individually work very hard and often put in long hours, yet the company as a whole can be slothful. In this case, the whole is less than the sum of its parts, thanks to management's shortsightedness.

3. Lust. This particular sin isn't committed by Apple as a company, although many Apple employees are guilty of lusting for power, and not just the power to be their best. Apple is notorious for its internal power struggles. Chief Operating Officer Michael Spindler's ascendance and Gassée's departure were just the most visible recent examples of Apple's power politics at work. Many former Apple employees recall the constant incredible political turf battles as one of the reasons they left. And everyone remembers the famous battle that ended with Sculley's wresting control of Apple away from Steve Jobs.

4. Gluttony. Apple's attempts to maintain its 52-percent gross-profit margin is gluttony in its purest form. You might also recall the short-lived price increases allegedly due to the DRAM shortage but in fact due to more of Apple's gluttony for profits. The continuing delays in announcing a low-cost Macintosh are also due to Apple's gluttony and attempts to skim the market, wringing the most profit out of the existing customer base before trying to increase market share.

5. Envy. Apple envies many companies, chief among them IBM, and has hired many managers and executives from outside in an attempt to emulate its competitors, only to have to let many of the newcomers go when they can't adapt to Apple's lack of structure (aside from its Byzantine political organization).

6. Anger. Apple demonstrated a definite capability for

How did Apple become even more money-hungry and less caring than IBM? Apple has succumbed to the lures that have plagued humanity for thousands of years.



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unreasonable anger with its firing of David Ramsey, a well-known programmer with a well-deserved reputation for helping Apple's customers on his own time. The excuse was that Ramsey had disclosed confidential information over CompuServe's MAUG forums, but the firing was really a reaction to many other leaks of company secrets. In its frustration at being unable to uncover the true sources of its anger, Apple misdirected its ire at someone who was trying to help the company.

7. Avarice. The really bad news is that what Apple seems to covet most is the money in its customers' wallets. Instead of trying to increase market share, the strategy has been to wring the maximum amount of money out of each sucker . . . er, customer. There are cars that cost less new than Apple's Macintosh Portable, IIci, and IIfx — and they get better mileage too.

So is Apple doomed? Apple's sins may seem overwhelming, but contrition is always possible and almost everyone stands ready to forgive Apple even its most heinous transgressions. The golden Apple may be tarnished, proving that Apple does indeed have a lot of brass, but most of us would love to see the shining, gleaming Apple that we remember from the glory days of the Apple II, and later the Macintosh, again.

Let's face it: We all want Apple to succeed, if for no other reason than to continue to give us an alternative to DOS and OS/2. Most Apple watchers expected Gassée to be the catalyst that would pull Apple out of the doldrums when he ascended to the throne. Now that he's gone, we'll have to wait and see if Herr Spindler, the new crown prince, has got what it takes.

Apple still has a lot of potential, and if the sins of the past can be avoided in the future, there's still a good chance that Apple can prevail. If Apple introduces a low-cost Mac later this year, if the company makes an aggressive attempt to build market share, if System 7.0 finally sees the light of day (even with a reduced feature set), and if employee unrest and unease can be stilled, Apple may yet succeed in spite of itself.

But if the current course isn't corrected, 1990 could be the beginning of the end.

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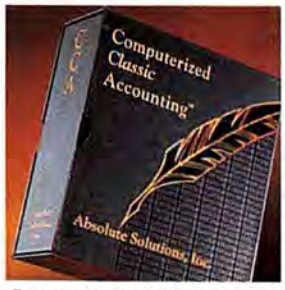
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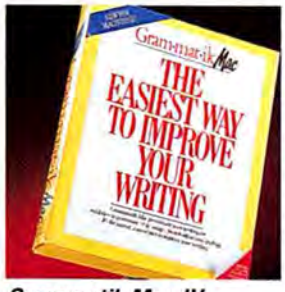
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Df0103 (360k/720k) 729.
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The MacZone

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	Integra 20	Integra 40	Integra 40Q	Porta 40	PLI 50 Turbo	Integra 80	Integra 80Q
Zone Price	$389	$449	$588	$640	$618	$639	$798
Zone Code	2636	2638	2738	3263	3268	2640	2739
Category	External Drive	External Drive	External Drive	External Drive	External Drive	External Drive	External Drive
Manufacturer	Dolphin Systems	Dolphin Systems	Dolphin Systems	Dolphin Systems	Peripheral Land, Inc.	Dolphin Systems	Dolphin Systems
OEM Mechanism	Seagate ST125N-1	Seagate ST157N	Quantum ProDrive 40S	Connor 3040	Seagate ST157N-1	Seagate ST1096N-1	Quantum ProDrive 80S
Formated Capacity	20.1 MB	47 MB	40 MB	40 MB	48 MB	20.1 MB	78.8 MB
Access Time (ms)	28 ms	32 ms	19 ms	25 ms	28 ms	28 ms	19 ms
ID Selection	Rotary	Rotary	Rotary	Rotary	Rotary	Rotary	Rotary
Termination	Internal	Internal	Internal	Internal	Internal	Internal	Internal
Cable (length, type)	4 ft. - 50/25 Pin	4 ft. - 50/25 Pin	4 ft. - 50/25 Pin	4 ft. - 50/25 Pin	3 ft. - 50/25 Pin	4 ft. - 50/25 Pin	4 ft. - 50/25 Pin
Warranty	1 Year	1 Year	2 Year	2 Year	1 Year	1 Year	2 Year
Software Bundled	Dolphin Install, 7 MB Public Domain & Shareware	Dolphin Install, 7 MB Public Domain & Shareware	Dolphin Install, 7 MB Public Domain & Shareware	Dolphin Install, 7 MB Public Domain & Shareware, Battery Saver	Turbo Cache, Turbo Spool, Turbo Backup, Turbo Optimizer	Dolphin Install, 7 MB Public Domain & Shareware	Dolphin Install, 7 MB Public Domain & Shareware

	PLI 100 Turbo	Porta 100	Integra 105Q	Integra 170	PLI 250 Turbo	Integra 300	PLI 300 Turbo
Zone Price	$998	$998	$998	$1488	$1948	$2398	$2398
Zone Code	3273	3264	2742	3271	3269	3272	3270
Category	External Drive	External Drive	External Drive	External Drive	External Drive	External Drive	External Drive
Manufacturer	Peripheral Land, Inc.	Dolphin Systems	Dolphin Systems	Dolphin Systems	Peripheral Land, Inc.	Dolphin Systems	Peripheral Land, Inc.
OEM Mechanism	Connor 100	Connor 30100	Quantum ProDrive 105S	Imprimis 170	Hitachi 250	Imprimis 300	Imprimis 300
Formated Capacity	105 MB	102 MB	102 MB	173 MB	251 MB	330 MB	327 MB
Access Time (ms)	20 ms	25 ms	19 ms	18 ms	16 ms	14 ms	16.5 ms
ID Selection	Rotary	Rotary	Rotary	Rotary	Rotary	Rotary	Rotary
Termination	Internal	Internal	Internal	Internal	Internal	Internal	Internal
Cable (length, type)	3 ft. - 50/25 Pin	4 ft. - 50/25 Pin	4 ft. - 50/25 Pin	4 ft. - 50/25 Pin	3 ft. - 50/25 Pin	4 ft. - 50/25 Pin	3 ft. - 50/25 Pin
Warranty	1 Year	2 Year	2 Year	1 Year	1 Year	1 Year	1 Year
Software Bundled	Turbo Cache, Turbo Spool, Turbo Backup, Turbo Optimizer	Dolphin Install, 7 MB Public Domain & Shareware, Battery Saver	Dolphin Install, 7 MB Public Domain & Shareware	Dolphin Install, 7 MB Public Domain & Shareware	Turbo Cache, Turbo Spool, Turbo Backup, Turbo Optimizer	Dolphin Install, 7 MB Public Domain & Shareware	Turbo Cache, Turbo Spool, Turbo Backup, Turbo Optimizer

	Quantum 40	Quantum 80	Quantum 105	Flipper 44	Infinity 40	Infinity 40/40	Infinity Optical
Zone Price	$449	$687	$797	$795	$1097	$1936	$4248
Zone Code	3245/3246/3265	3247/3248/3266	3249/3250/3267	2416	2181	2182	2851
Category	Internal Drive	Internal Drive	Internal Drive	Removable Media	Removable Media	Removable Media	Optical Media
Manufacturer	Dolphin Systems	Dolphin Systems	Dolphin Systems	Dolphin Systems	Peripheral Land, Inc.	Peripheral Land, Inc.	Peripheral Land, Inc.
OEM Mechanism	Quantum ProDrive 40S	Quantum ProDrive 80S	Quantum ProDrive 105S	Syquest SQ555	Syquest SQ555	Syquest SQ555	Sony
Formated Capacity	39.4 MB	78.8 MB	103 MB	43 MB	42.5 MB	42.5 MB/42.45 MB	573 MB
Access Time (ms)	19 ms	19 ms	12 ms	20 ms	19 ms	19 ms	60 ms
ID Selection	---	---	---	Rotary	Rotary	Rotary	Rotary
Termination	---	---	---	Internal	External	External	External
Cable (length, type)	---	---	---	4 ft. - 50/25 Pin	3 ft. - 50/25 Pin	3 ft. - 50/25 Pin	3 ft. - 50/25 Pin
Warranty	2 Year	2 Year	2 Year	2 Year	1 Year	1 Year	1 Year
Software Bundled	Dolphin Install, Includes Bracket & Cables	Dolphin Install, Includes Bracket & Cables	Dolphin Install, Includes Bracket & Cables	Dolphin Install, 7 MB Public Domain & Shareware	Turbo Cache, Turbo Spool, Turbo Backup, Turbo Optimizer	Turbo Cache, Turbo Spool, Turbo Backup, Turbo Optimizer	Turbo Cache, Turbo Spool, Turbo Backup, Turbo Optimizer

PLI

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MacUser
1·9·8·9
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ILLUSTRATION: PAUL J. FISCH

GUY KAWASAKI

Reviewing Reviews

I never had to worry about product reviews because I used to get everything for free. Now I have to pay for stuff, so accurate reviews mean a lot to me. I've been a developer and a consumer, and although I've never written a review, many reviewers have poured their hearts out to me. My conclusion is that the review process kind of sucks but we can make it much better with a little effort.

The Problems

Reviews in some magazines generally overpromise and underdeliver. Most of us think we are reading in-depth, perceptive, and meaningful reviews that will enable us to make smart purchasing decisions. Instead, we get reviews that are:

Inaccurate. Many reviews don't include any benchmarks and contain simple mistakes and omissions. Reviewers claim products can do what they cannot do and cannot do what they can do. Sometimes it seems the only qualification of a reviewer is to be able to move the mouse and read a table of contents.

Shallow. Magazines compete to be the first to review a new product. Thus, reviewers are forced to review products quickly so that their magazine can beat the others. The rationale is that the first magazine that does a review is on top of things, that the magazine that is on top of things gets more readers, and that the magazine with more readers can charge more for advertising.

Inconsistent. Ever notice that reviews for similar products within a given magazine are often done by different people? If the same person did them, we could compare the reviews of competing products over time and get a feeling for how products compare with each other.

Deceptive. We assume that reviewers have no conflict of interest. That's not always the case. FileFaker consultants who write FileFaker reviews know the product well, but they may also depend on leads and referrals from FileFaker, Inc.

Incomplete. Reviews in car magazines often cover car use over two or three years and 15,000 to 30,000 miles. Such reviews tell us what it's like to own the car months after the honeymoon. In the computer market, reviews cover two or three weeks and 15 to 30 launches. That's not a fair appraisal — no one can thoroughly review PageMaker or QuarkXPress without having published at least one book with the program.

The Victims

One thing you have to say about the review process is that although it sucks, it sucks for everyone. For example:

Reviewers. Pity the poor reviewers. They get three weeks to review four products in 2,000 words for 25¢ a word. That's $500 — or roughly what a laid-off Apple employee gets for a half day of doing his old job as a consultant. Reviewers are expected to understand, measure, and critique software plus hundreds of pages of documentation that took three to four man-years to create.

Developers. Developers spend three to four man-years creating a product that a bad review can destroy in a week. Most developers would say that it's OK if the reviewer accurately and fairly finds faults that matter, because no product is perfect. It often doesn't happen this way, however. Rule of thumb: The amount a reviewer harps on a shortcoming is inversely related to how much it affects people.

Magazines. When magazines print reviews, they are earnestly trying to provide a valuable service to readers. In return, they get angry threats of lawsuits and cancellations of advertising by developers, calls and letters from upset fans of products, and demoralized reviewers.

Users. Above all, pity the poor users who read reviews and then buy stuff based on them. Knowing what I know about products and then reading reviews of them, I shudder to think that users are making buying decisions based on what they read.

Developers can spend years creating a product that a bad review can destroy in a week.

The Cures

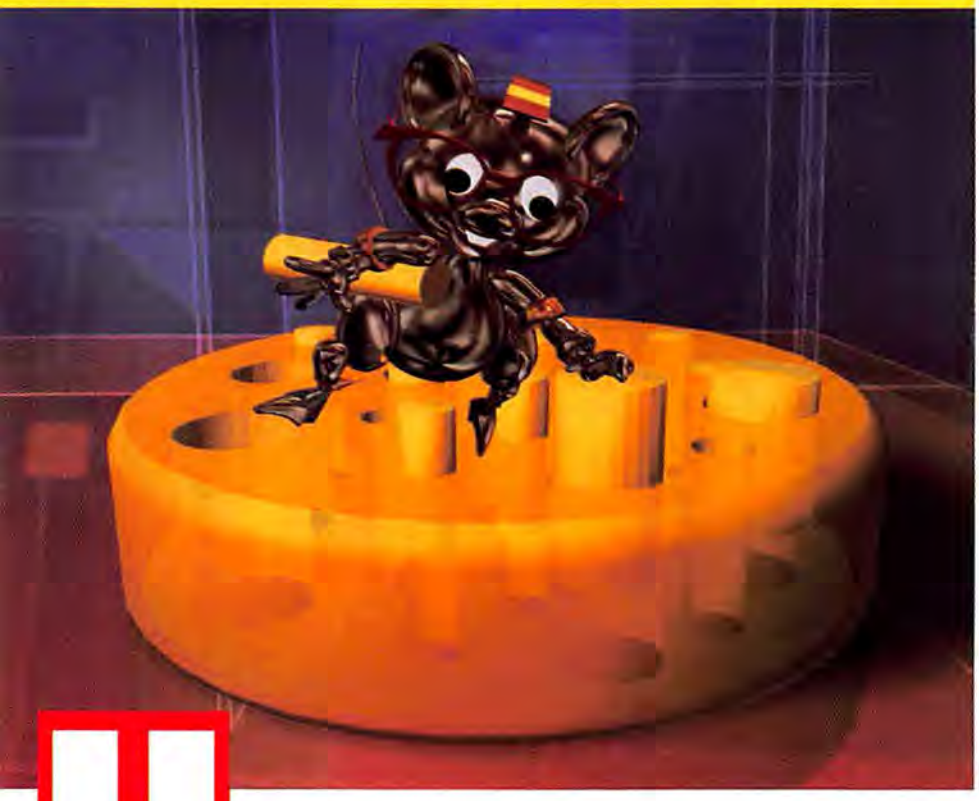
Let me recommend some cures for the problems with the review process:

Compensation. Pay reviewers more. If magazines paid more for reviews, they'd get better people to do them. To get the money, magazines should stop throwing those ridiculous, $100,000, party-envy Macworld



By Guy Kawasaki

V A R O O M !



H

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MacUser
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Until now, conventional disk optimization was a grindingly slow process which tied up your computer too long and played Russian roulette with your spinning hard drive. Not anymore. Now, ALSoft's new, improved DiskExpress II Release 2.04 is the very fastest and safest disk optimization software ever developed for the Mac. Using revolutionary Disk Optimatic™ technology, only DiskExpress II has the intelligence to work intuitively and automatically to keep your drive optimized forever. DiskExpress II also has built-in extra sensitivity to any kind of user, serial or file activity, making it totally transparent in a work situation. So, you'll not only notice much faster disk performance than ever before, you'll see a dramatic improvement in file access times and in your productivity, right from the very first time you optimize. After all, when it comes to speed and your hard drive there's always a little ***varoom*** for improvement. To order the new, improved DiskExpress II Release 2.04, call ALSoft today.

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KAWASAKI

Expo bashes. What would you rather have, better parties or better editorial?

Patience. Give reviewers more time to use the products. And give them fewer products to review. This means that magazines need the courage to believe that *good* reviews are more important than *immediate* reviews for their readers.

Openness. Contact the developers prior to publishing a review, to discuss the problems and shortcomings. Give developers the opportunity to explain why the problems and shortcomings aren't as serious as they seem. (This recommendation will never fly, because magazines believe that developers will get upset if they know what's coming and will call their ad-sales reps or the publisher to try to squelch the review.)

Commitment. Commit to longer-term reviews. Magazines and reviewers need to commit to reviews of multiple products over a longer term. Then we can get a better idea of how programs compare with each other and what it's like to use a product after the honeymoon.

Full disclosure. Provide more information about reviewers, such as educational and professional background. It's OK to be a FileFaker consultant and review FileFaker, as long as readers are aware of the bias. Any person who's a consultant for the developer or its competitors should be banned from the category. Period.

One Last Thing

This column isn't going to change the system, so you know that reviews will still be flawed. That's where common sense comes in. Reviews provide only a starting point to help us make our decisions, so we need to ask around. Rule of thumb: Talk to two people for each $100 that the product costs.

Ultimately, we have the most to gain by making an intelligent product purchase and the most to lose by making a dumb one. It's our responsibility to separate fact from fiction.

[*We know Mr. Kawasaki can't be talking about* us; MacUser*'s review/reviewer policies coincide with nearly every item on his wish list—except he left off the one about properly compensating the tireless editors who have to deal with all those well-paid columnists—Ed.*]



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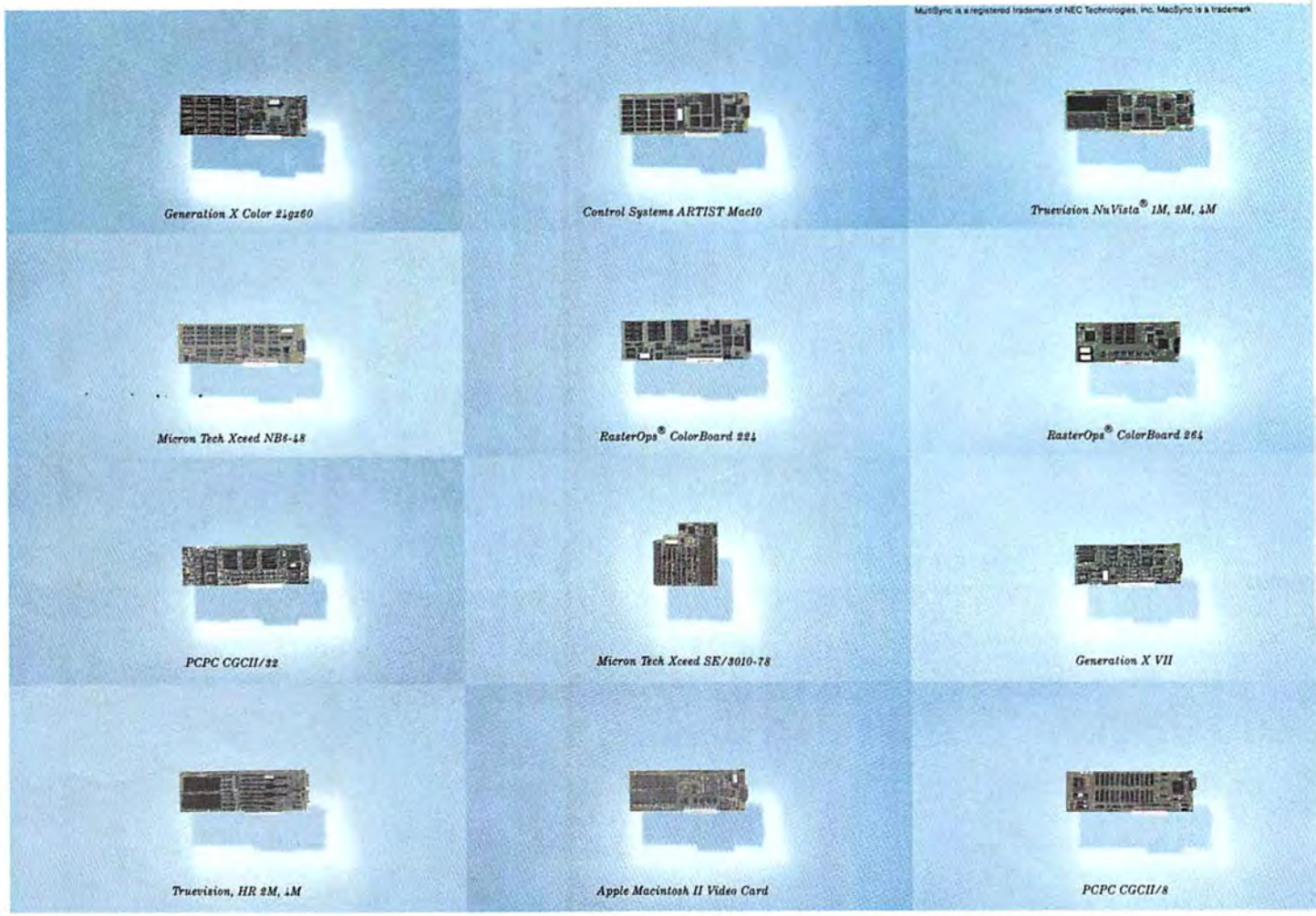
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Not an unusual claim for a 4-star restaurant. But for a monitor, it's quite a story. With NEC's multiple-frequency technology, our monitors can accept all kinds of video cards for applications ranging from standard desktop software to large-screen graphics design. And your NEC dealer has several different Macintosh-compatible MultiSync® monitors he'd be glad to show you. In fact, he might even take plastic.

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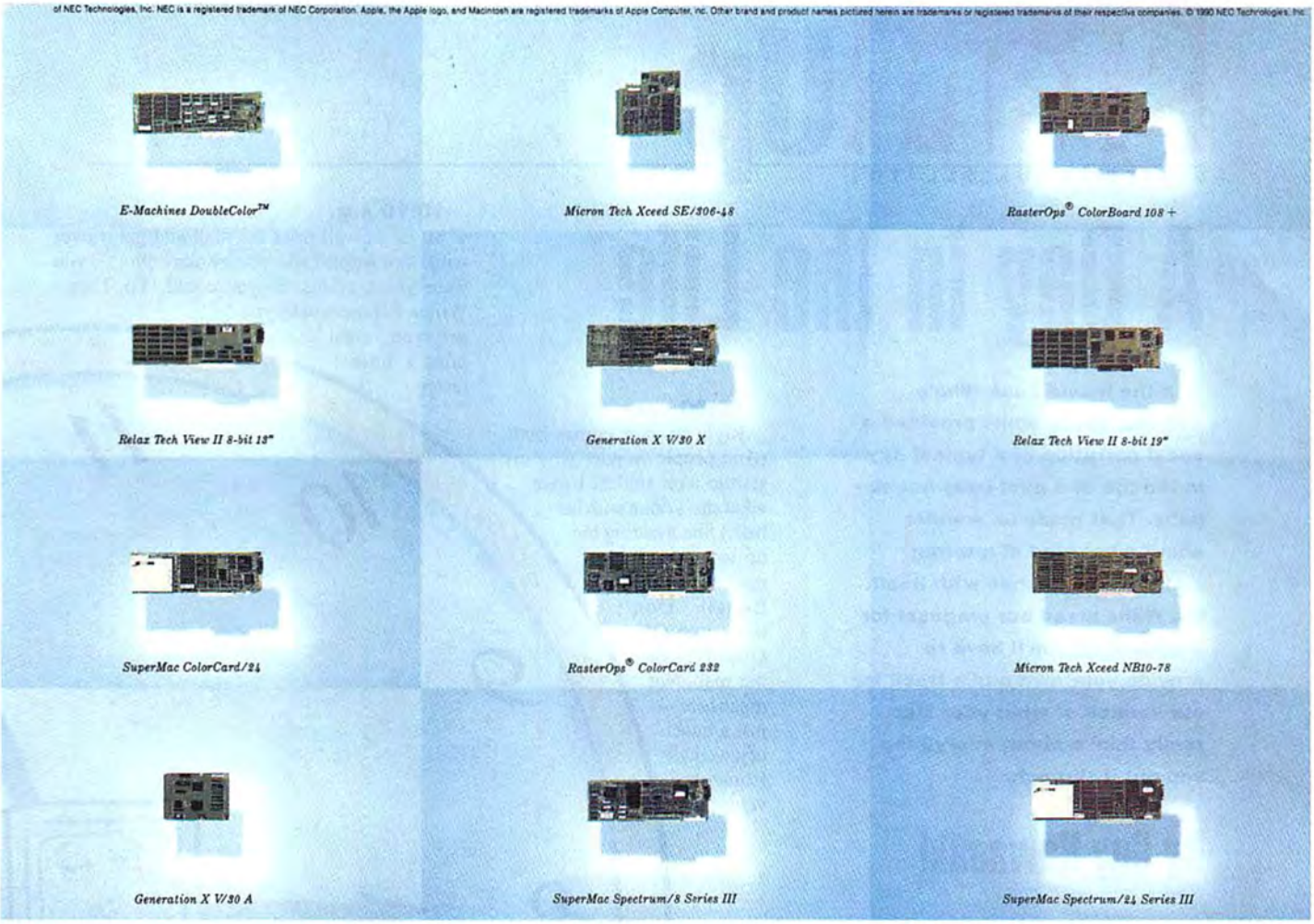


MacSync™ Series *Designed exclusively for Macintosh II video card and compatibles. Available in both non-glare and new high-contrast 14" screens.*



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A Day in the Life

In the movie *Look Who's Talking*, Bruce Willis provided a vocal narration of a typical day in the life of a post-baby-boomer baby. That made us wonder about what kind of internal dialog your Mac has with itself. Mr. Willis nixed our proposal for a sequel, so you'll have to provide your own audio track for our version of what your Mac really thinks about everything you put it through.

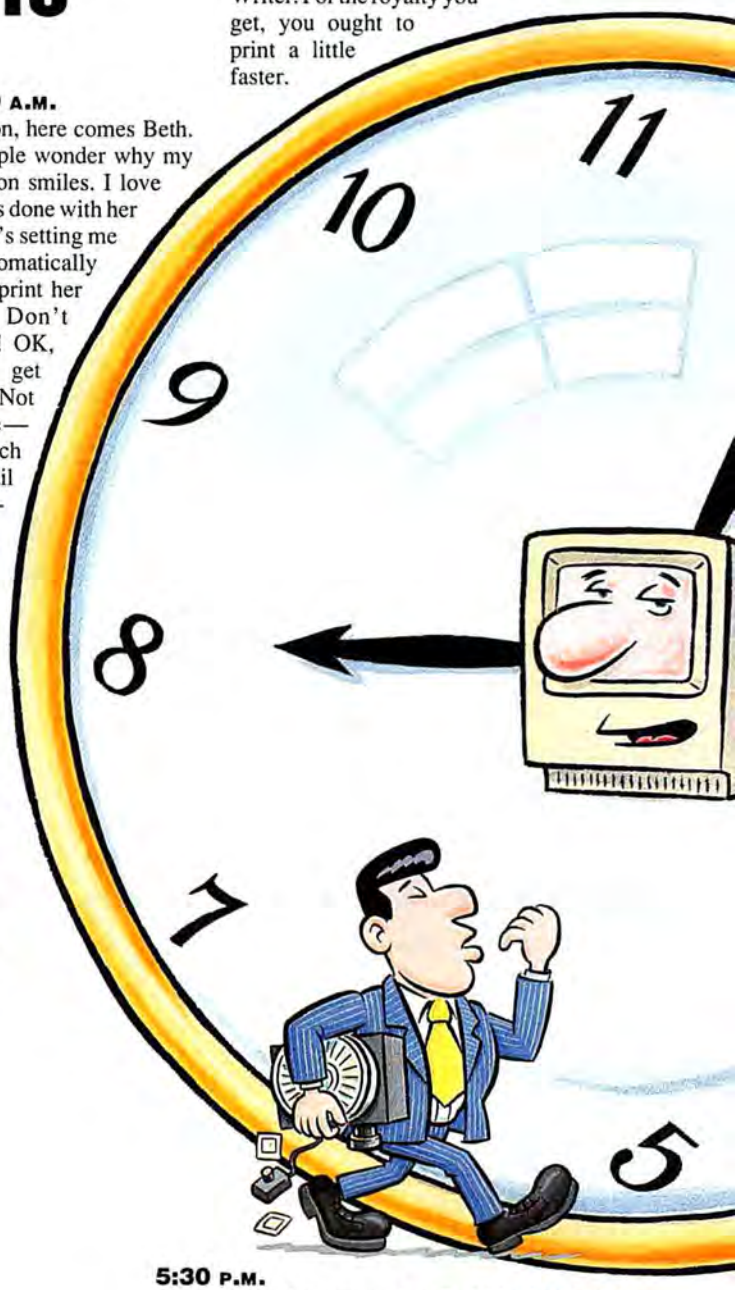
By Guy Kawasaki



8:00 A.M.
Man, it's early. I don't know why they leave me on all night. They think it's cute to have all those fireworks going off all night, but those dumb things give me nightmares so I can't sleep. It was cold last night — I felt like my disk drive was stuck in glue.

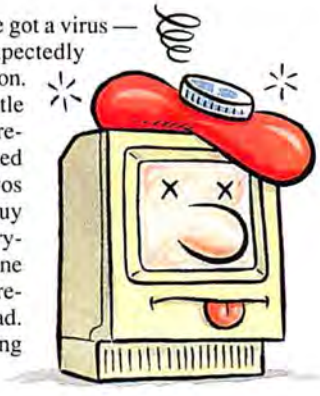
10:00 A.M.
Right on, here comes Beth. (And people wonder why my startup icon smiles. I love what she's done with her hair.) She's setting me up to automatically read and print her E-mail. Don't leave me! OK, OK, I'll get the mail. Not much here — just a bunch of junk mail from developers.

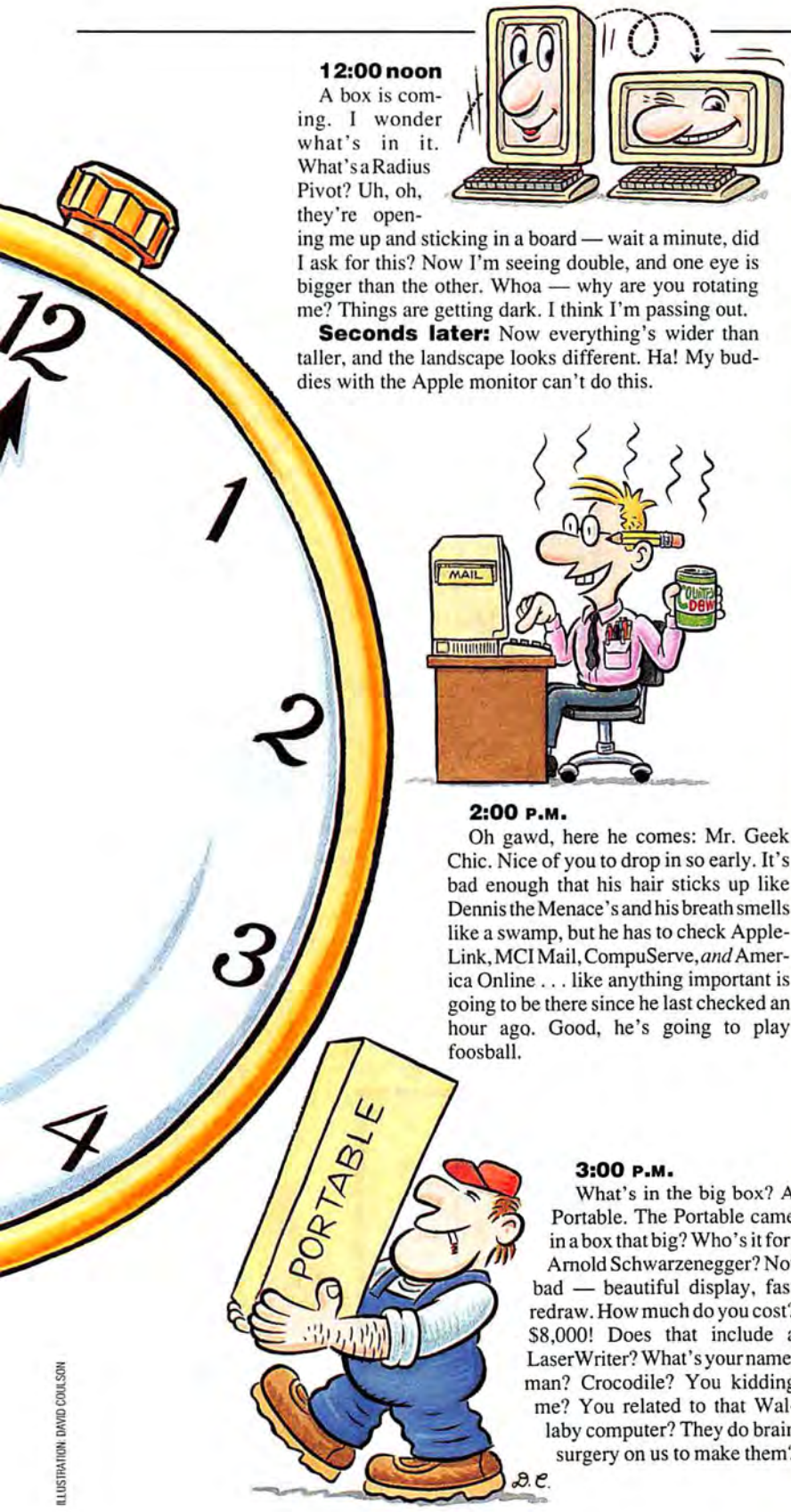
10:10 A.M.
Might as well print the mail and get it over with. Yo, AppleTalk, you awake? Oh . . . you were going as fast as you could. Yo, LaserWriter. For the royalty you get, you ought to print a little faster.



5:30 P.M.
Oh no. Here he comes. Joe Red-Hot-MBA Puke-Yellow Tie. What's he doing here this late? Must be trying to impress someone. He's booting PowerPoint. It figures — he's got to do one more of those content-free presentations. I'm going to fragment my memory. Here you go, bozo — "PowerPoint cannot be launched. Most likely you don't have enough RAM. Try quitting another application." It worked. He's going to the PC.

6:00 P.M.
I just know I've got a virus — I've been unexpectedly quitting all afternoon. I'm feeling a little raw around the resource fork. I tried telling these yoyos that they should buy SAM. I hope everyone leaves me alone for a while. Fireworks aren't so bad. It sure beats doing Windows.





12:00 noon

A box is coming. I wonder what's in it. What's a Radius Pivot? Uh, oh, they're opening me up and sticking in a board — wait a minute, did I ask for this? Now I'm seeing double, and one eye is bigger than the other. Whoa — why are you rotating me? Things are getting dark. I think I'm passing out.

Seconds later: Now everything's wider than taller, and the landscape looks different. Ha! My buddies with the Apple monitor can't do this.

2:00 P.M.

Oh gawd, here he comes: Mr. Geek Chic. Nice of you to drop in so early. It's bad enough that his hair sticks up like Dennis the Menace's and his breath smells like a swamp, but he has to check AppleLink, MCI Mail, CompuServe, *and* America Online . . . like anything important is going to be there since he last checked an hour ago. Good, he's going to play foosball.

3:00 P.M.

What's in the big box? A Portable. The Portable came in a box that big? Who's it for: Arnold Schwarzenegger? Not bad — beautiful display, fast redraw. How much do you cost? $8,000! Does that include a LaserWriter? What's your name, man? Crocodile? You kidding me? You related to that Wallaby computer? They do brain surgery on us to make them?

D.E.

ILLUSTRATION: DAVID COULSON

NewsLine

Reports and Analysis

JUDGE JUNKS XEROX SUIT

SAN FRANCISCO, CA — Less than four months after Xerox sued Apple Computer, charging the computer maker with copying Xerox's Star system for the Lisa, Macintosh, and Finder, U.S. District Judge Vaughn Walker threw out five of the six counts in the $150 million suit. Xerox plans to appeal in August, when the remaining count will be heard.

APPLE BUSTS CLONE MAKER

TAIPEI, TAIWAN — Taiwanese police, working on a complaint filed by Apple Computer, raided the offices of Akkord Technology and Flive Computer, makers of the Mac clone known as the Jonathan. Apple obtained a unit and found that it contained allegedly illegally copied Mac ROMs and other software. Akkord's spokesman said that the Jonathan was not being sold and had only been constructed as a demonstration model. Apple's complaint charges five people with copyright and trademark infringement.

JUDGE SQUASHES '030

AUSTIN, TX — In a bizarre climax to a fractious copyright-infringement suit between Motorola and Hitachi, U.S. District Judge Lucius Bunton issued a ruling that bars Motorola from selling its 68030 chip — the heart of most of the Mac line — in the United States. The ruling ordered the companies to pay fines to each other. It also banned Hitachi from selling its H8 microprocessor and Motorola from selling its 68030 chip for the duration of the Hitachi patent. The judge charged both companies with violating each other's patents and strongly criticized both litigants for bringing the suit in the first place. Bunton agreed to stay the enforcement of his ruling to allow time for Motorola to file an appeal. Industry observers believe that Bunton's ruling was intended to force the companies to reach an out-of-court settlement as soon as possible.

LOTUS EATS NOVELL

CAMBRIDGE, MA — Lotus Development and Novell have agreed to a $1.5 billion stock swap that will merge the two companies and thus create the largest independent personal-computer-software publisher, relegating Microsoft to the unfamiliar position of No. 2.

Bobker's Dozen

By Steven Bobker
Bobker's Dozen, c/o *MacUser*
950 Tower Lane, 18th Floor
Foster City, CA 94404
Your suggestions, comments, and products for consideration are welcome.

1 Disk Doubler ★★★★½

The price of permanent storage keeps dropping, but hard-disk drives are still expensive and floppies can hold only so much. Disk Doubler is a neat package that helps you make the most of the space you already have. The main working part of the package is an INIT that puts a DD menu into all your applications. This short menu has file-compression and -expansion options that let you store files in substantially less disk space.

Disk Doubler is a very efficient compressor. It's noticeably better (that is, the compressed files are smaller) than StuffIt, the current standard. There's a Disk Doubler application, so files created by the INIT can have distinctive desktop icons and can be expanded with a double-click.

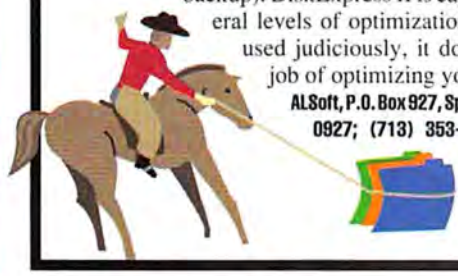
Performance is outstanding. I've discovered no conflicts with any of my INITs. If only Disk Doubler could read StuffIt files — that's promised for an upcoming version — it would rate as the best of its kind.

Salient, 3101 Avalon Court, Palo Alto, CA 94306; (415) 852-9567. Version 1.0. $59.95.

2 DiskExpress II ★★★★★

The best hard-disk optimizer recently got better. DiskExpress II is much quicker and better than its predecessor, DiskExpress. It is by far the best hard-disk optimizer (or defragmenter) available.

DiskExpress II is controlled by a well-designed cdev and can be set to run automatically (Disk Optimatic), in the background (or at a regular preset time), or manually. Since I don't trust any program that's running automatically in the background, I rarely use the automatic mode. That's OK, because DiskExpress II is fast enough to run manually (after, of course, a full backup). DiskExpress II is capable of several levels of optimization, and when used judiciously, it does a perfect job of optimizing your disk.



ALSoft, P.O. Box 927, Spring, TX 77383-0927; (713) 353-4090. Version 2.04. $89.95.

3 Disk Ranger ★★★★

Disk Ranger is primarily an excellent file-cataloging program. It's quick and has superb filtering abilities (so you can catalog exactly what you want and no more), plenty of useful sorting options, and good report-printing ability. It would rate highly even if that were all it could do.

It comes with a DA, Ranger Reader, that reads the catalog files Disk Ranger creates and searches effectively for files. Disk Ranger also prints decent labels — on ImageWriters only, but in color if you have a color ribbon. The package comes with a supply of pin-feed labels. Disk Ranger can also "scrunch" — or defragment — files of a user-specified size and larger.



Everything works quite smoothly. The optimization isn't of DiskExpress quality, but it's OK.

Graham Software, 8609 Ingalls Circle, Arvada, CO 80003; (303) 422-0757. Version 4.0. $59.95.

4 Hard Disk Util ★★★★



Some useful programs are still blighted by copy protection. That's unfortunate but a fact of Mac life. As long as such programs exist, you'll need tools such as Hard Disk Util. The latest version of this old standby (along with its ancillary utilities) is still a useful and excellent performer. It can put an unprotected copy of virtually every business application that is still protected onto a floppy or hard disk. It also deprotects many education and entertainment programs. Operation is quick and simple. Just be sure to check that Hard Disk Util can handle the software you need to deprotect.

FWB Software, 2040 Polk St., Suite 215, San Francisco, CA 94109; (415) 474-8055. Version 3.0. $149.95.



5 The Debugger V2 and MacNosy ★★★★½

Programming requires debuggers. Most of today's environments come with some kind of debugger, but that's not always the best tool. An excellent stand-alone package consists of The Debugger V2, which (no surprise) is a run-time debugger, and the latest version of MacNosy, a well-established global interactive decompiler.

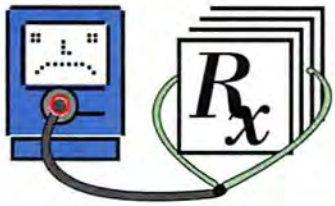
These are powerful tools. Neither is aimed at the casual user, but that's not the author's intent; this is strictly pro gear. The Debugger is really great if you have two screens available. It can present so much information in so many windows that a regular screen gets very cluttered. A new feature is its IBS (Interactive Build System), which can save a great deal of testing time.

Both parts of the package work well with all common environments, including THINK Pascal and C and all flavors of MPW (Macintosh Programmer's Workshop). The manual, however, can be confusing.

Jasik Designs, 343 Trenton Way, Menlo Park, CA 94025; (415) 322-1388. Version 2. $350.

6 MicroRX SE1 ★★★★

Who do you call when your SE breaks down? Certainly not Ghostbusters. If you have the MicroRX SE1 stack, you can use it (on another working Mac) to diagnose the problem and either fix it yourself or tell your repairperson exactly what's wrong. The details are meant for qualified service techs, but anyone can use MicroRX to gain a much better knowledge of what's inside the SE.



MicroMat does repairs and also sells do-it-yourselfers the necessary parts. This volume is the first in a planned series that will cover all Apple CPUs and printers (the price includes four updates). It's nicely done and easy to use and can save you a lot of money if your SE fails. It can also help you learn more about your Mac.

MicroMat Computer Systems, 7075 Redwood Blvd., Bay #4, Novato, CA 94947; (800) 829-6227 or (415) 898-6227. Version 1.01. $100.

7 CleanPath Computer-Controlled Maintenance Kit ★★★



The power in your computer is electronic, but its human/computer interface is physical. The interface gets dirty and degrades performance. Discwasher provides tools and software (in a large plastic case) that let you clean your screen, keyboard, floppy-disk drive, and dot-matrix printer (print head and platen). The kit provides special cleaning fluids, wipes, swabs, and two drive-cleaning disks. The supplies should last for more than a year if you have a single computer with one or two floppy-disk drives. The cleaning materials are high quality, easy to use, and effective.

Computer-Controlled in the product name is a bit misleading. The kit contains crude software that can tell you if it's time to use the cleaning tools, and each element of the kit has on-screen instruction sheets. This is *not* computer-controlled. You might be able to find the cleaning materials separately for less, but having them all together and in a storage case is useful for the cleaning-impaired. Even if your work environment is reasonably clean, dust can collect on your Mac pretty quickly. Regular cleaning can keep your Mac healthy longer.

Discwasher, 4310 Transworld Road, Schiller Park, IL 60176; (708) 678-9600. $59.95.

8 State Data ★★★½

As sources and amounts of data increase, so does their ability to overwhelm us. State Data is a series of stacks that presents a tremendous amount of information about the 50 states. Teachers will find these well-designed and -integrated stacks a useful resource, and curious students will get a taste of what sort of data is available.



There are some flaws. The data sources are several years old. If you want more-current data, you can gather and enter it yourself. Although extensive, the data set often seems limited, and some of the selections, such as those of places to visit, seem strange. In sports, the emphasis is entirely on professional teams. State Data is a nice supplement to a social studies or geography course, but it isn't a stand-alone tool. It is not an entire curriculum in software, and as with any teaching tool, it's only as good as the educational program in which it's used.

DataDisc International, 1430 Willamette, Suite 236, Eugene, OR 97401; (503) 686-9859. $40.

9 Better Working: The Resume Kit

★★★

The résumé is one of those staple documents most of us like to have up-to-date and handy. It's reassuring as well as useful. Better Working: The Resume Kit is a port of a fairly popular MS-DOS program. It does an adequate job of structuring simple résumés but ultimately isn't much better than a good word processor.

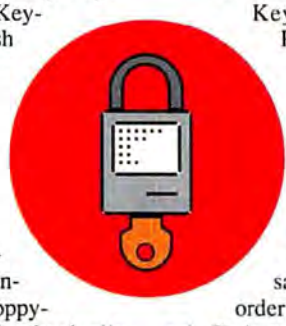
For example, I sometimes found it impossible to select a font; more formatting options are clearly needed. What the program could really use is some good examples and templates. The Resume Kit is a good place to start, but that's not really enough.

Spinnaker, 1 Kendall Square, Cambridge, MA 02139; (800) 323-8088 or (617) 494-1200. Version 1.0. $59.95.

10 KeyLock

★★★½

Computer security is never a simple one-step process. Just as there are many ways to breach the defenses of a computer, there are many ways to keep it safe. KeyLock, a Swedish product, deals with two of the doors into your computer. The most important element is a piece of hardware that is inserted into the floppy-disk slot and physically locked. It prevents other people from bypassing your software security by booting from a floppy disk. It's also useful for computers that are displayed on dealer's floors or at shows. The number of people who walk up to such computers and attempt to copy software from them is astounding. KeyLock stops that practice cold.



The software portion of KeyLock, called PSW, consists of an INIT that demands a correct password during startup and a DA that darkens the screen and requires the same password in order to give up control. Both parts are reasonably effective but — without the hardware lock — can be bypassed by booting with a floppy that has a System and Finder.

VikingTech, 533 1/2 Via De La Valle, Suite E, Solana Beach, CA 92075; (619) 792-1385. $129.95.

11 Draw Tools

★★★★

MacDraw II is an excellent draw program and the best-seller in its category, but it could be better. Draw Tools self-installs three DAs directly into the application. Sizer does exact scaling and dimensioning; calculates enclosed areas; and lets you resize a drawing, either absolutely or relatively. You can lock corners or edges before doing any resizing operation. Adjacency brings together any two selected objects; it's more precise and much faster than zooming and manually moving elements. Tools adds a handy menu that lets you clip or extend existing lines and build fillets.

These valuable features add significant CAD power to MacDraw II. There are some limitations on when the tools can be used, however (they don't work on imported bit maps, for example), and sometimes they're a bit awkward to use. Overall, though, they make an excellent add-on for users of regular MacDraw II.

Paracomp, 123 Townsend St., Suite 310, San Francisco, CA 94107; (415) 543-3848. Version 1.1. $99.

12 Backmatic

★★★★★

Most computer users don't back up nearly often enough. Remembering to do an incremental backup at the end of the working day is often one chore too many. Backmatic is a tool designed to solve that problem. It's an INIT (with a cdev) that scans your hard disk whenever you shut down and backs up all files that have been changed since it last ran. The backup can be to floppies or to a folder on your hard disk or server.

Since you may neither want to back up all changed files nor have the room or time to do so, the ability to exclude files is important. Backmatic has wide-ranging and easy-to-use exclusion abilities.

Backmatic isn't quick (it scans all the disks on-line before acting), but it is utterly reliable. Backing up is an essential part of safe computing, and the one thing that stops users doing it regularly is that it's tedious. For automating a daily backup, there's no better utility.

Magic Software, 2206 Franklin St., Bellevue, NE 68005; (800) 342-6243 or (402) 291-0670. Version 1.03. $99.95.

13 Remember?

★★★★



Remember? is a nice shareware INIT that lets your Mac remind you of what you said you'd do. Every time you start up, if you've entered a note for the day via Remember?'s DA, it puts up a window with the details. The occasion list is easy to maintain. The DA also lets you check your calendar for the week ahead and other time periods.

Implementation is clean — Remember? lacks only a keyboard command equivalent to make it go away — and it behaves well. Sometimes the window appears when you think something else will happen, but nothing has ever been harmed or damaged. And with Remember? helping me, I now get to most of my meetings.

David Warker, 1330 W. North St., Egg Harbor, NJ 08215-1763. Version 1.3. Shareware: $10.



EYESORE VS. EYE PROTECTION

As today's monitors get bigger and brighter, anti-glare filters become less of an option and more of a necessity.

The right filter can combat eye fatigue, help eliminate headaches, even reduce overall body stress.

Yet, the irony is that something so good for your eyes can be such an eyesore.

In fact, most filters look like they belong to someone else's system.

The fit is sloppy. The colors don't match. The materials are different.

Kensington has a different idea.

Instead of making a filter that will fit on any monitor, we make filters that will only fit a *specific* monitor.



An example is our Maccessories® SE Anti-Glare Filter.

It looks so much a part of the SE, you would think it was designed by the same people who designed the SE.

The styling is complementary.The color identical. Even the same material is used.

And unlike generic filters, the fit is perfect. So light passes through the filter, never around it.

Kensington uses only optical quality glass with a ceramic anti-reflection and scratch-resistant coating.



The result is a 96% reduction in glare. And an improvement in contrast and clarity of up to 20 times.

In short, the most advanced eye-protection system you can find today–it even filters out VLF and ELF radiation and dissipates static.

Kensington has custom designed screens for the Mac, Mac Plus, Mac SE, Apple IIGS, as well as for the entire Mac II family of large screen monitors.



For a free brochure, and the dealer nearest you, call 800-535-4242. In New York call 212-475-5200.

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GRAPHICS & DESIGN

Photoshop

Adobe's 32-bit photo-retouching program blends power with simplicity.

Photoshop combines powerful image-editing capabilities with an unintimidating interface. It's easy to use right away, and the more you get to know it, the more you benefit from Photoshop's tools, modes, options, and special layers.

POWER WITHOUT PENALTIES You don't need a megasystem to run Photoshop, but a hard-disk drive with adequate free space is a must. In 2-megabyte or MultiFinder configurations, Photoshop uses its own virtual-memory scheme. Photoshop also lets you work with 24-bit images, even on 16- or 8-bit hardware. The dithered colors are quite acceptable. As much of Photoshop's work is compute-intensive, graphic accelerators don't help, but a faster CPU does.

Photoshop's editing tools extend the typical set found in retouching software. The eraser, pencil, brush, airbrush, smudger, and edge-softening water drop are there, plus a sharpening tool, a graduated-fill tool for linear or radial gradients, an anti-aliased (nonjaggy) line with optional arrowheads, and a rubber stamp that lets you easily duplicate part or all of an image by simply painting it, instead of copying and pasting. Both the eraser and rubber-stamp tools can erase a part of the current image down to its last saved version.

Teamed with ATM, Photoshop applies smooth-edged, anti-aliased text to your image. The image-editing tools style or process text in infinite ways.

Most tools have customization settings to determine how quickly they act and what aspects of the image they modify. Some basic modes include Normal, Color Only, Darken Only, and Lighten Only. The paintbrush and airbrush can take advantage of Wacom's line of pressure-sensing digitizing tablets (see the review, June '90, page 64).

FLYING COLORS Photoshop includes important photo-editing functions such as brightness and contrast control, color balance, hue/saturation modification, and equalization — all of which you can fine-tune to your specifications. When it's time to apply new colors to an image, you can select hues in a variety of ways, including using a special color picker or an Option-key-activated color sucker that grabs a color from any open document. Or you can do it visually or numerically with RGB, CMYK, or HSB entries. You can also mix your own colors with the floating color palette, which has its own paint-mixing area.

The paint's transparency can vary from 0 to 100 percent, letting you create ghostlike overlays, simulated reflections, blended edges, and subtle tints. You can make custom tool shapes (up to 64 x 64 pixels) and custom color patterns from any rectangular image selection.

Photoshop's Paste Controls let you control the interaction between a pasted selection and the receiving site, so you can adjust the overall transparency and high and low ranges of all the colors that comprise the final overlay. For example, you could prevent all the reds in a selection from being pasted or protect the background's bright greens from being affected by a paste.

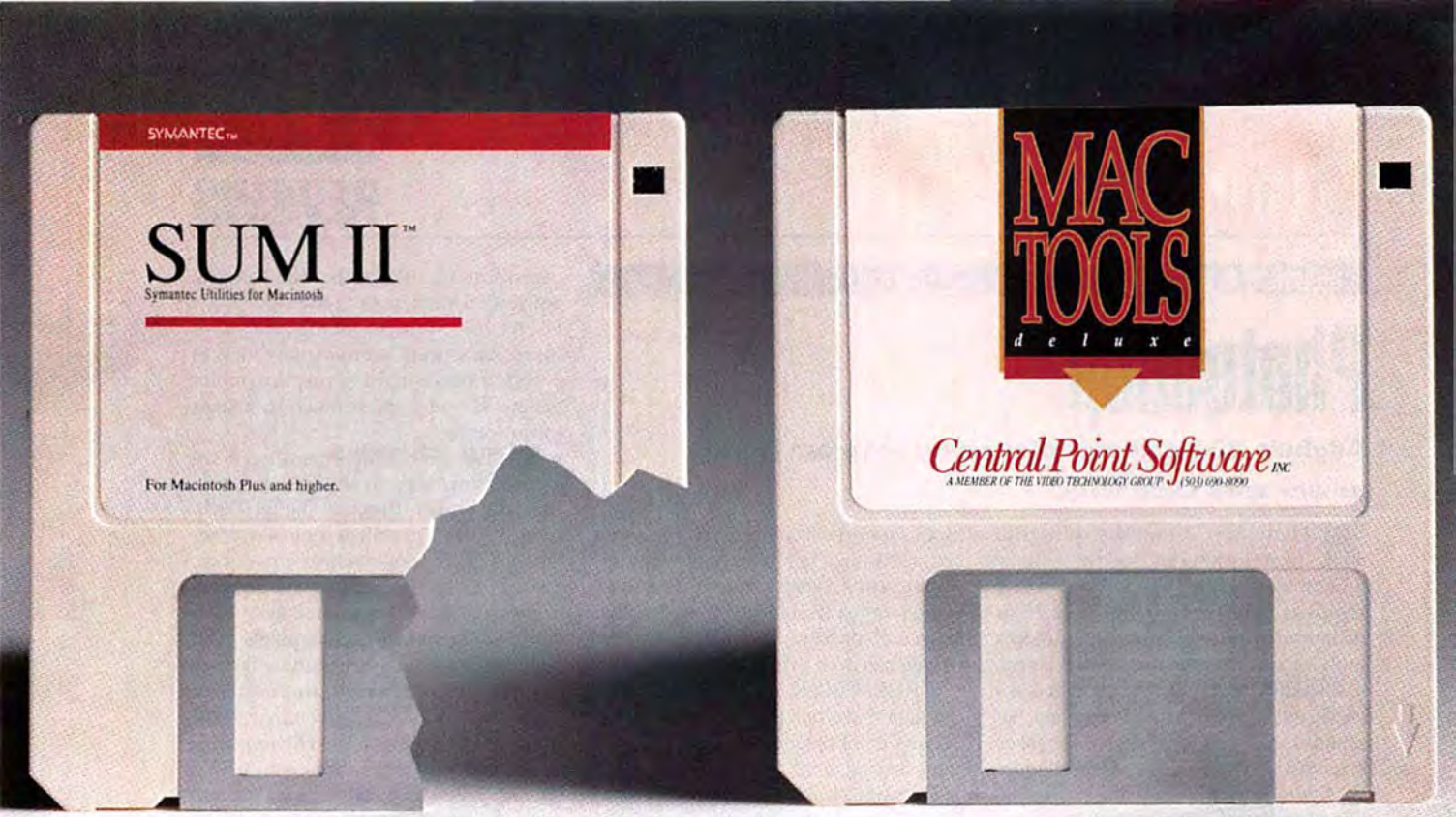
Photoshop can work with documents in several color depths. The 8-bit-indexed-color mode, regardless of your display's capability, limits editing actions to selecting, cutting, and pasting. You can't do anything directly to the image colors — any changes you make must be done to the 256-color palette, which will create color changes overall. In gray-scale mode, you're limited to 256 grays, but you can still use all the tools. You can also convert a document from one color mode (1-, 8-, 16-, 24-bit) to another, but you'll lose some aspects, such as smoothness in color transitions and diversity in the color palette, if you convert down to a shallower format.

NATURAL SELECTION Photoshop's selection tools, with capabilities similar to those in Silicon Beach's Digital Darkroom, give you excellent control over selection areas. Tools include a marquee, an oval, a lasso (which can also serve as a polygonal selector), and a magic wand worth its weight in 32-bit pixels. The wand automatically seeks the edges of the color region in which you click. You can vary its color-seeking range from exact to approximate, so clicking in a yellow spot can either capture only very similar yellows or extend into orange areas. A selection made with any tool can also be expanded manually to include areas of similar colors. You can even select discontiguous areas of similar colors *everywhere in the image.*

Using selection tools and key modifiers, you can add or subtract areas from an existing selection. You can also toggle between selected and unselected areas. And in order to blend the edges of a selection into its receiving site, you can feather its borders.



Photoshop packs a lot of power into a package that's still easy to use. This image is a composite of two scans plus gradient-filled anti-aliased text. The paintbrush in the Color Only mode turned the headband from pink to blue without affecting details. The vase contains several extra flowers that are modified clones.



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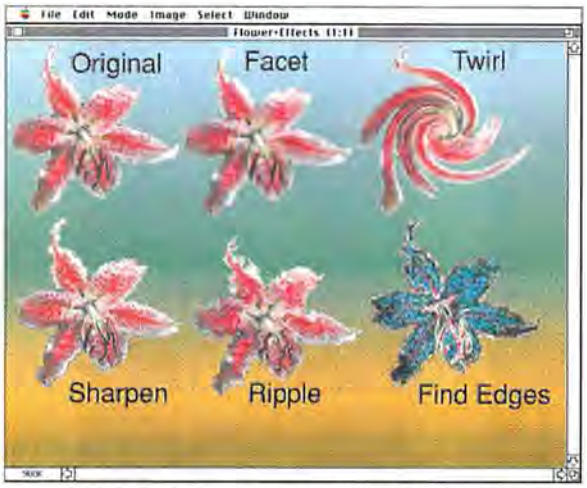
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×	×	×	**Hard Disk Backup**
×		×	Multiple File/Folder Selection
×		×	Data Compression
×		×	Multiple Setup Files
×			**File Locator DA**
×	×		**Hard Disk Partitioning**
×			Automount w/Password Prompt
×	×		**Hard Disk Optimization**
×			Complete Disk Erase
×			Color Disk Map
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Minimum requirement: Macintosh Plus. MacTools is a registered trademark of Central Point Software. All other product names are trademarks of their manufacturers.

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A few of Photoshop's filters produced these botanical mutations. The gradient fill behind the flowers was poured into the selection as an afterthought.

Selection tools offer a quick way to mask the rest of the document from accidental change. Paint and other editing actions affect only selected areas. You can apply ordinary and special effects to just a selection or to the whole image. Effects include those of all the color tools and image filters, plus resizing, distorting, and rotating.

SWITCHING CHANNELS Although you can work with the full-color version of an image, Photoshop can also divide it into layers, based on the color model you're using — RGB, CMYK, Indexed (256) Color, HSL, or HSB. The RGB mode produces three separate layers, or channels, plus a fourth full-color RGB channel. You can edit the RGB channel, which affects all four channels simultaneously, or edit the red, green, or blue channels separately.

Then there are the alpha channels — additional layers that can be used for holding special attributes such as transparency values or the shape of intricate selections for later use. Photoshop offers multiple alpha channels that you can use and delete as needed. These stay with the document as long as it's saved in Photoshop's own format.

Alpha channels have only 8 bits per pixel. You can use the painting tools in an alpha channel, but they behave as if they were in gray-scale mode. And if you're numerically inclined, you can perform mathematical operations on the pixels in any two channels.

INS AND OUTS Photoshop is able to import and export more than a dozen file formats, including EPSF, TIFF, PICT file, PICT resource, Amiga IFF/ILBM, CompuServe GIF, MacPaint, PIXAR, PixelPaint, Scitex CT, TGA, and ThunderScan. Given enough information, it can even import files in new or undocumented formats. Output options include whole-image printing and color separations. You can control halftone screen type, frequency, and angle and apply a set of fudge factors, called Transfer Functions, that enable you to adapt Photoshop's halftone printing to the idiosyncrasies of your imagesetter, printer, or stock.

THE BOTTOM LINE Photoshop is an excellent investment for any organization that routinely handles color bit maps. Although it's not a complete substitute for a high-end dedicated system, it makes powerful photo editing accessible, painless, and easy. It's an excellent choice for most day-to-day image work.

— Salvatore Parascandolo

Get Info

Photoshop ★★★★½
Published by: Adobe Systems, 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039-7900; (415) 961-4400.
Version: 1.0.
List Price: $895.

GRAPHICS & DESIGN

Image Analyst and Enhance

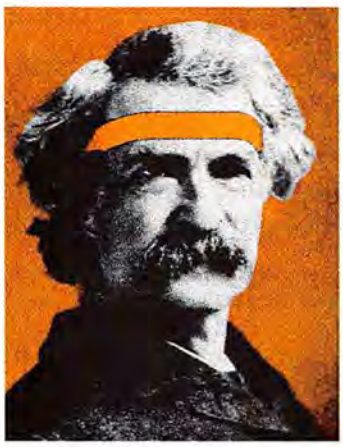
When it comes to image processing and analysis, these packages cover both ends of the spectrum.

Now that both image processing and photo retouching have come down to the Mac from mainframes, the distinctions between the two techniques are blurring at the edges. Some image-manipulation tools (such as filters) traditionally used in image processors are now found in graphics programs such as Adobe Photoshop (see the preceding review). But with scientific image processing for medical research, aerospace, and robotics, the goal is not to alter the picture but to extract quantifiable data. Image Analyst takes the high-end data-analysis road, while Enhance treads a fuzzy line between graphic arts and measurement.

IMAGE ANALYST Those familiar with image processing on high-end hardware will be amazed at what Image Analyst can do. In a matter of minutes — and without any programming — you can set up a process to identify and analyze any element of an image. Measurements and statistics can be automatically or interactively generated from TIFF or PICT files or from captured video images.

Image Analyst recognizes items in images based on size, shape, and position. In fact, Image Analyst grew out of Automatix's RAIL (the Mac version is called MacRAIL) programming language, developed specifically for image processing and robot vision and control. For those who want a custom application, IA/Source ($6,000) contains the Image Analyst/MacRAIL source code and development environment.

Image Analyst directly supports the Data Translation and Scion frame grabbers. A menu command lets you capture images from a video camera, VCR, or other NTSC or PAL device. You can even buy a microscope hookup from Donsanto, a distributor of Nikon microscopes. Image Analyst controls your captures,



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Genius doesn't take sweat. It takes DESK.

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Spreadsheet and Charting. Track business and home finances. Whip together "What if?" worksheets. Includes over 45 powerful functions. Change text font, size, style, and color, in cells. Generate pie or bar charts you can modify in Draw or Paint (in color or B&W).

Paint. Create or edit black & white, gray scale and color images (2, 4, 8, 16 and yes, even 24 bit). Works with TIFF, MacPaint®, and PICT files. Multiple windows.

Draw. Object-oriented graphic editing. Edit auto traced images from Paint, forms and labels from Database, and charts from Spreadsheet. Rotate text. Supports B&W and color. Open as many windows as you need.

Personal Secretary. Never forget appointments, deadlines, birthdays, bills, or taxes again. Secretary gives you discrete reminders no matter what you're doing. And it won't be hurt if you tell it to leave you alone.

Telecommunications. Use a modem or serial port to communicate with other computers. Upload or download files while you're using another application (even without MultiFinder).

If you find it hard to believe DESK can do all this, visit you local software dealer today for a demo, or call us toll free at 1-800-482-4567 for a detailed brochure.

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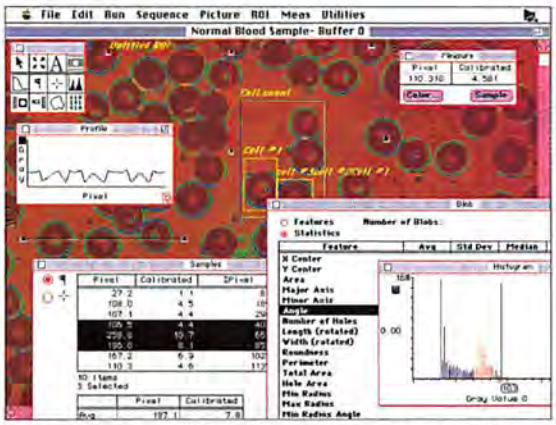


Image Analyst is a high-end tool for image analysis. This microscope image was originally gray scale, but color was added for greater definition. The rectangles are areas in which automatic analyses can be set up. Statistics are automatically generated in the Blob and Samples windows. The Profile window is displaying the gray values along a line below it.

and you can calibrate each image so that measurements are reported in real-world values: metric, English, or pixel. The color can also be calibrated with the ILUT (input lookup table) tool to change pixel values before you do any processing.

There are two types of files: the image itself and a Sequence file, which contains the processing, measurements, and analysis you set up. Sequences can be named and saved independently of an image, so you can easily keep track of common measurements. You benefit from having separate files because sequences can be used over and over on different images, and you have to set them up only once.

Automated sequences are set up in ROIs (regions of interest), which are represented by movable, resizable boxes on top of an image. Inside an ROI, Image Analyst can find the distance between edges or the centers of holes, the area of a shape, or the average thickness of a cell wall. You don't even have to define the measuring points: Image Analyst finds the center, edge, or other positions for you.

In addition to using the automatic sequences, you can work interactively, using the 12-item tool palette. The profile tool can help you pinpoint the exact edge of an object by displaying a graph of the pixel gray value along a line you draw. A cursor on the graph corresponds to a moving cursor on the line.

You use the measurement tool to make interactive measurements. Just draw a line anywhere on the image, and the line's measurement appears in a small window. The blob tool automatically generates statistics for shapes, and the samples tool generates statistics for pixel or line measurements. Both tools let you save a statistics file, which can be updated from within Image Analyst.

I have focused on measurement, but Image Analyst's image-manipulation features are substantial and very useful for filtering out nonessential elements or for bringing out features in an image. You can select color ranges for processing in several ways — via histograms, a CLUT (color lookup table) tool, or the ILUT tool.

The standard Apple Color Picker is used to change the color of any of the graphs, text, and lines, as well as the palettes in the CLUT and ILUT. You can make text permanent on the image or leave it in editable windows.

It's not difficult to learn Image Analyst, but the process is hampered by a poor manual. Although well illustrated, it's not well written, often using terms without defining them. Also, the images used in the tutorial are not provided with the package. In fact, no sample images are provided. For $2,000, you expect a little more help.



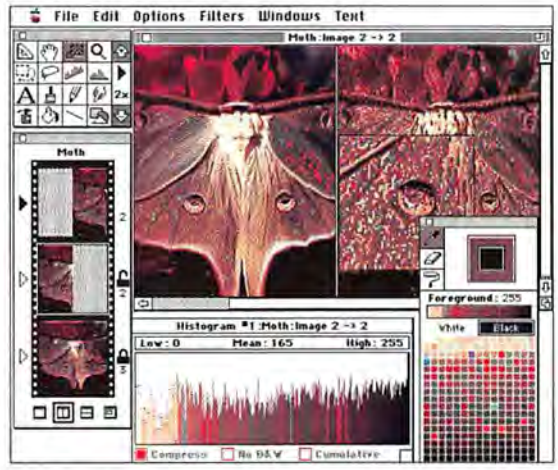
ENHANCE Enhance is a low-priced image processor suited for researchers with lighter data-extraction needs or graphic artists who are familiar with image processing. It doesn't have nearly as many measurement tools as Image Analyst does, but it does have a densitometer, and tools to measure things like center of mass and perimeters are in the works. What really carries Enhance are the graphics tools of a first-class photo-retouching program.

The ruler tool works like Image Analyst's measurement tool, except that it also gives you angle measurement. Lengths are displayed in both metric and English units, from microns to kilometers and inches to miles. The calibration isn't automatic as in Image Analyst: You have to tell it how many pixels per yard. It is not as accurate either, because it doesn't account for nonlinear effects from lenses.

Enhance can alter images so that a trained eye can get qualitative information from them. Filters — special effects based on mathematical algorithms — are one way to bring out hidden features. If you count the variations, Enhance has approximately 80 filters, all menu choices. If you know what a "Laplacian, Medium Noise" filter is, you're in luck; if not, you'll have to learn what the filters do in order to get the most out of them. You can easily modify filters or create them from scratch by using the Convolution command in the Filters menu.

A very nice image-handling feature is the buffers palette, which can display up to three thumbnail versions of the image you're working with. If you want to prevent alteration of a version, you can lock a buffer. The buffer tools also enable you to display two of the buffers as a split screen in the full-sized window.

Enhance comes with a good stable of paint tools, including a spray can, brush, pencil, and smudge to blend colors. There are also text and shape-drawing tools. Enhance's masking abilities are also quite useful to graphic artists. To create a mask, you can select an area to fill in black or



Enhance blends technical-image processing with high-level graphic-arts tools. Two different versions of an image, taken from the buffer pallet at the left, are shown here in split-screen mode. The magnifier tool is used on the moth on the right. The histogram and color palette are also shown.

use the filtering tools to create black areas.

Other tools give you lots of control over your image. The zoom tool is one of the best I've seen, offering several methods of enlarging or shrinking images. Even more useful is the magnification tool, which turns your cursor into a square magnifying glass and magnifies a portion of the image as you pass over it.

Files can be saved as TIFF, PICT, EPSF, or text, although EPSF files cannot be imported. Like Image Analyst, Enhance suffers from a weak manual. There are plenty of sample images but no tutorials at all.

THE BOTTOM LINE Image Analyst is to scientific image processing what Photoshop is to image manipulation. Enhance falls short of both Image Analyst and Photoshop, but it is the only package on the market that combines elements of both. I can recommend both of these programs, but for different users: Image Analyst is for high-end-data gatherers, and Enhance is for lower-end-data gatherers with high-end graphic needs.

Both are 8-bit-color, gray-scale programs with excellent interfaces (although you'd never know Enhance was a color program from looking at its black-and-white packaging). Both require a Macintosh II or later, but Image Analyst needs 5 megabytes of RAM (I recommend 8 megabytes); Enhance requires only 2 megabytes. Enhance is a great value as a graphics program; Image Analyst costs five times as much but is a bargain compared with similar technical software on minicomputers and workstations.

— John Rizzo

Get Info

Image Analyst ★★★★½
Published by: Automatix, 755 Middlesex Turnpike, Billerica, MA 01821; (508) 667-7900.
Version: 7.1.
List Price: $2,000.

Enhance ★★★★½
Published by: MicroFrontier, 7650 Hickman Road, Des Moines, IA 50322; (800) 388-8109 or (515) 270-8109.
Version: 1.01.
List Price: $375.

STORAGE

FastBack Tape

Packing an excellent tape drive and backup software into one box produces a solid one-stop backup shop.

Fifth Generation Systems recently entered the Mac hardware market with FastBack Tape, a 128-megabyte tape drive bundled with a new version of the firm's general-purpose backup utility, FastBack II.

THE TOTAL TAPE SOLUTION FastBack Tape includes everything you need to back up your precious data in one convenient package: an FB120 tape drive, FastBack II 2.10, manuals for both, a SCSI terminator block, one preformatted DC 2110 minicartridge, and all the necessary cables. (For a review of FastBack II 2.0, see October '89, page 62.)

The FB120 tape drive is a SCSI device, with a push-button switch on the back for setting its SCSI ID. It contains the same 3M MCD Series II mechanism used in the Tecmar QT-Mac80, which garnered the only five-mouse rating in our December '89 Lab Report, "Getting It on Tape," page 189. These drives read from and write on quarter-inch tapes adhering to the QIC-128 standard, and they can also read from — but not write on — tapes created on QIC-100 drives, most notably the Apple Tape Backup 40SC.

The DC 2110 minicartridge is smaller than a pack of cigarettes but can hold up to 86 megabytes of data. An extended-length version of this tape, the DC 2165, can hold 128 megabytes. And with the improved data-compression algorithm of FastBack II, you can squeeze up to 80 percent more information onto a tape, depending on the contents of your files.

BACKUP BENCHMARKS Using a Mac II with 2 megabytes of memory and the Control Panel RAM Cache set to 32K, I timed the FB120 as it backed up a 5-megabyte data set from an internal Quantum 40 hard-disk drive. The FastBack Tape had a respectable showing of just under 2 megabytes per minute. That may sound mighty fast, but keep in mind that other backup media, such as 44-megabyte SyQuest removable cartridges, offer even better performance.

FastBack Tape is a solid piece of hardware, and the new version of FastBack II is a good program done one better (it now features DAT support, file selection by color, and preservation of AppleShare privileges. In addition, Fifth Generation Systems offers free — but not toll-free — telephone support from 8 A.M. to 5 P.M. CST, Monday through Friday. You can obtain technical help on-line through AppleLink, CompuServe, GEnie, MacNET, and Fifth Generation's own bulletin-board system.



FastBack Tape is a combination of a 120-megabyte tape drive and the latest version of FastBack II in one package. The FB120 can store more than 128 megabytes on a single minicartridge.

THE BOTTOM LINE FastBack Tape is costly and a little slow compared with other backup devices (as are all minicartridge drives), but if you've decided that tape is the medium for your Mac, you'd be hard-pressed to find a more polished product.

— Owen W. Linzmayer

Get Info

FastBack Tape ★★★★½
Manufactured by: Fifth Generation Systems, 10049 N. Reiger Road, Baton Rouge, LA 70809-4559; (800) 873-4384 or (504) 291-7221.
List Price: $1,395.



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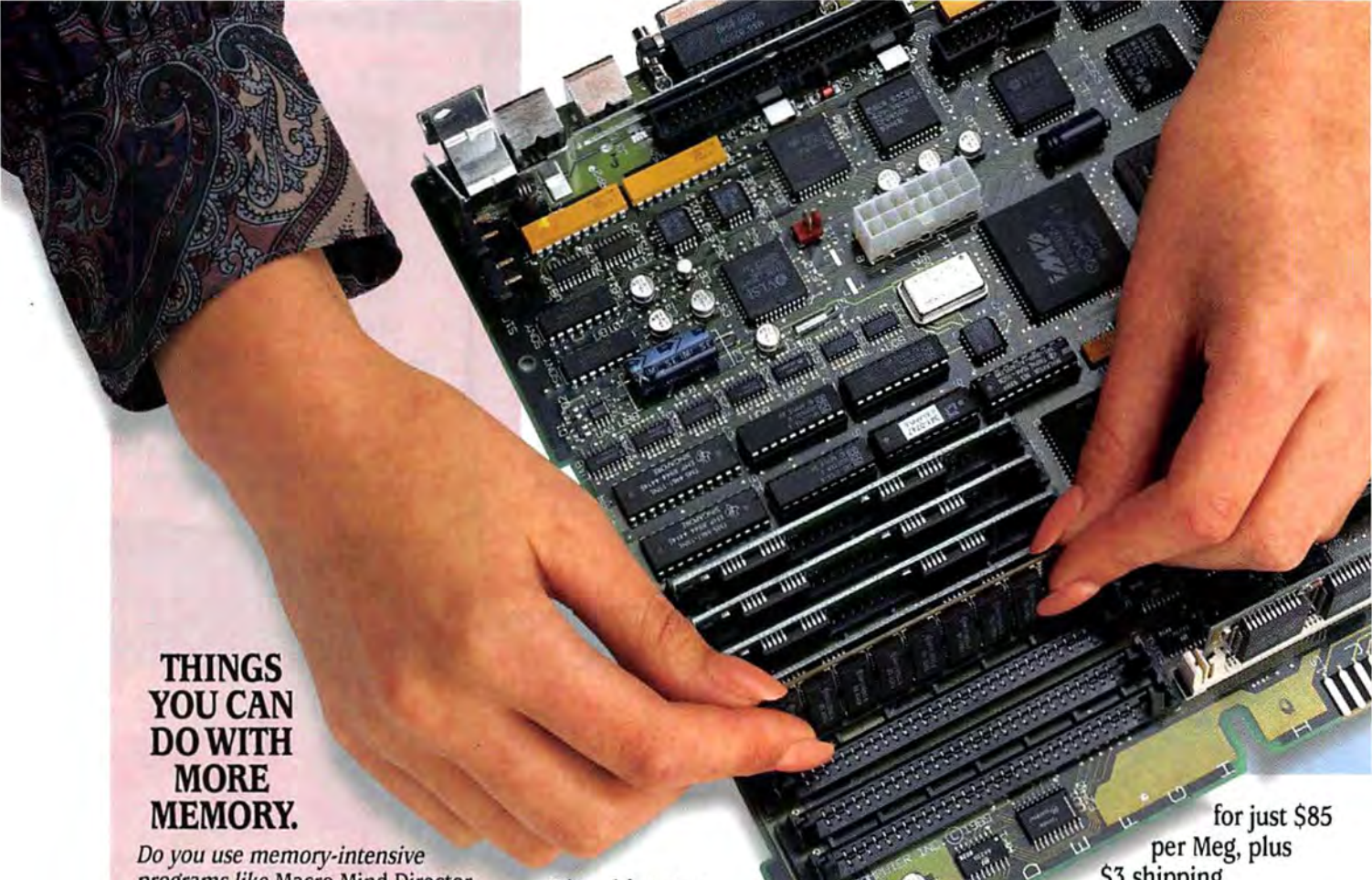
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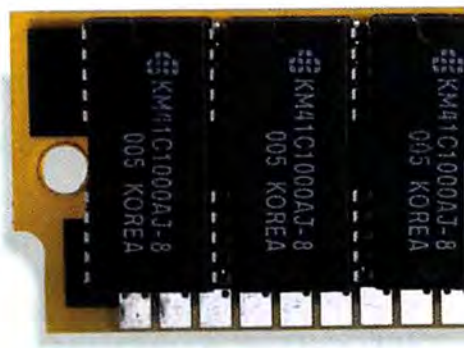
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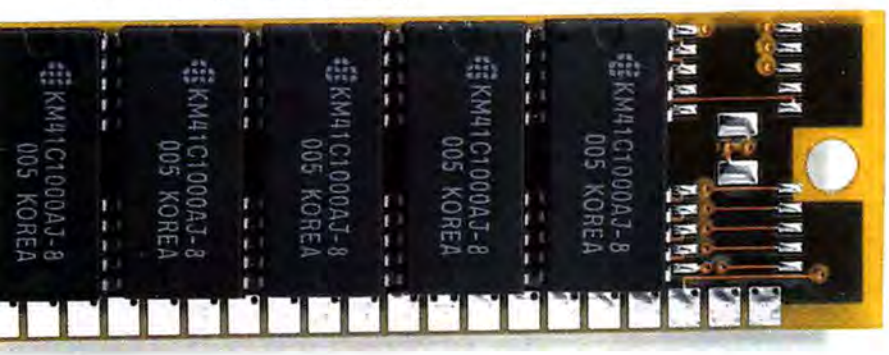
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*Most manufacturers (including Apple) get a little nervous about non-authorized personnel (that means you) working inside their machines. Be advised that opening your Mac may void the warranty, so check with your dealer if you're concerned.

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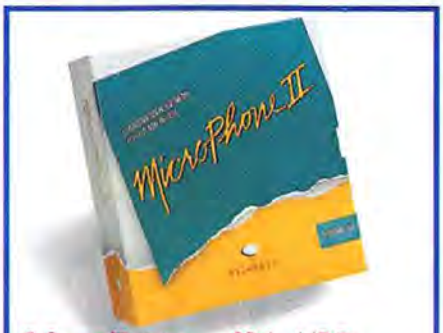
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5625 PixelPaint Professional 1.0 389.
3G Graphics
3942 Images with Impact: Graphics 1 . . . 50.
4583 Images with Impact: Business 1 . . . 65.
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5908 Publish It! 1.2 279.
★T/Maker ... 30 day MBG
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3633 ClickArt Christian Images 39.
5167 EPS Business Art. *special* 69.
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6576 Vietnam Remembered *(CD-ROM)*. . 69.
6370 Quick Art *(CD-ROM)* 175.
★Wildflower ... 30 day MBG
6512 SnapJot 2.0 32.
★Zedcor ... 60 day MBG
3986 DeskPaint & DeskDraw 3.0 115.

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★Beacon Technology ... 30 day MBG
6426 Gems of The Word 1.0 25.
4967 HyperBible 1.0 *(King James)* 145.
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Broderbund Software
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5166 SmallTalk/V Mac 1.1 125.
★Dream Maker ... 30 day MBG
4115 MacGallery *(HyperCard)*. 27.
★Foundation Publishing ... 60 day MBG
6701 HyperSpeller 1.0 29.
Hyperpress Publishing
4233 Icon Factory 1.0 45.
ICOM Simulations
5681 HyperTMON 1.0. 58.
4085 TMON 2.8.4 87.
Individual Software
4719 101 Scripts & Buttons HyperCard 1.0. 35.
★Leister Productions ... 30 day MBG
7126 Reunion 89.
★Manx Software ... 60 day MBG
4075 Aztec C + SDB 3.6B. 95.
★MicroMaps ... 30 day MBG
5512 HyperAtlas 1.0 59.
★Microsoft ... 30 day MBG
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★Now Software ... 30 day MBG

6739 Prototyper 2.1 185.

★Silicon Beach ... 60 day MBG

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6703 Inside SuperCard *(Microsoft Press)* . 17.

★Softstream Int'l., Inc. ... 30 day MBG

6513 Authenticate & Mutate 79.

5440 HyperHIT 2.2 125.

★Somak Software ... 30 day MBG

5897 ScriptEdit 1.1 49.

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3420 THINK C 4.0 $165.

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★TML Systems ... 30 day MBG

3549 TML Pascal II 3.1 *(w/MPW 3.1)* . . . 109.

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HyperTools #1 or #2 *each* 52.

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3587 True BASIC 2.02 55.

★Zedcor ... 60 day MBG

3985 ZBasic 5.0 88.

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★Affinity Microsystems ... 60 day MBG

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★Aladdin Systems ... 30 day MBG

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6740 StuffIt Deluxe 1.0 63.

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★Casady & Greene ... 60 day MBG

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1729 QuicKeys 1.2 63.

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5041 Mac Tools Deluxe 1.1 75.

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6122 Virtual 2.02 (for Mac II, incl. PMMU) . 188.

★Dantz Development ... 30 day MBG

5255 Retrospect 1.1 149.

Dubl-Click Software

6653 MenuFonts 3.0 30.

1824 Calculator Construction Set 2.05. . . 45.

★Electronic Arts ... 30 day MBG

1843 Disk Tools Plus 1.01 *(Batteries Incl.)*. 31.

★Fifth Generation ... 30 day MBG

4287 PYRO! 4.0 *(screen saver)* 22.

3954 PowerStation 2.5.2 33.

3955 Suitcase II 1.2.5 43.

5178 FastBack II 2.1 106.

5725 DiskLock 1.0 106.

★HJC/Microcom ... 30 day MBG

4803 Virex *(lastest version)* 52.

5885 Virex *(10 Pack)* 329.

ICOM Simulations

4084 On Cue 1.3 35.

★Insight Development ... 30 day MBG

6171 MacPrint 1.2 94.



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6087 Smart Alarms *(5-8 users)* 149.

6086 Smart Alarms 3.02 *(9-15 users)* . . . 199.

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2591 The NightWatch 1.03 85.

6134 MacSafe II 107.

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6267 KiwiEnvelopes! 3.0 34.

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5442 PictureBook 3.2 39.

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6385 On Location 1.0 75.

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6748 Norton Utilities for the Mac 84.

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6647 HandOff II 52.

★Solutions, Inc. ... 60 day MBG

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3449 SuperGlue II 2.01 61.

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3382 SuperLaserSpool 2.02 87.
3378 SuperLaserSpool 5-Pack 2.02 . . . 289.
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3780 ImageWriter II Label Pack *(Qty. 216)* 15.
3781 LaserWriter Label Pack *(Qty. 216)* . . 18.
4976 StickyBusiness 1.2 89.
6927 StickyBusiness Plus 1.2 149.

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5177 XTreeMac 1.02 50.

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4655 World Class Leader Board Golf 25.

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1184 Hardball *(CP)* 26.
4484 Mean 18 *(CP)* 26.
6760 Test Drive II-The Duel 31.



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5127 Manhole *(CD-ROM)* 34.
5517 Cosmic Osmo 40.

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5886 Star Wars *(CP)* 23.
4099 Shufflepuck Cafe *(CP)* 23.
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4540 Ancient Art of War at Sea *(CP)* 26.
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5755 Where/Europe Carmen Sandiego?*(CP)* 29.
5233 Where/USA Carmen Sandiego? *(CP)* 29.
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4966 SimCity 1.1 29.
5871 SimCity Supreme 47.
6515 SimCity Terrain Editor 16.
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4074 P51 Mustang Flight Simulator *(CP)* . 31.

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5726 Voyager 1.2 89.

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2268 Crystal Quest 2.2T 25.
4119 Crystal Quest w/Critter Editor 2.2T . 39.

Coda Music Systems

5854 MusicProse 1.0 187.
5604 Finale 2.0 559.

Davidson & Associates

1734 Math Blaster! 1.0 *(CP)* 26.
6128 Math Blaster Mystery *(CP)* 26.

★Electronic Arts ... 30 day MBG

6297 Halls of Montezuma 26.
6716 Pipe Dreams 17.
6663 Sands of Fire 29.
5554 Bard's Tale 32.
4064 Chuck Yeager Flight Simulator 32.
6594 Starflight 39.
1846 Deluxe Music Construction Set 2.5 . 84.



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5278 FM1 Beginning FileMaker. 36.
5279 FM2 Intermediate FileMaker 36.
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6466 Citadel 27.
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5773 Strategic Conquest Plus 2.0 34.
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1842 Chessmaster 2100 28.
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3571 Algebra *(with workbook)*. 45.
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4842 MacLink Plus/Translators 4.12 99.
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6758 DoveFax Desktop 279.
4939 FastNet III 375.
4938 FastNet SE 375.
5624 FastNet SE/30 375.
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5295 News/Retrieval Membership Package 24.
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4866 Timbuktu/Remote 1.0.1 123.
6371 Timbuktu/Remote Access Pack .. 849.
5664 PhoneNET StarConnector 19.
6273 PhoneNET StarConnector 10-Pack . 129.
2203 PhoneNET Connector *(DIN-8)* 31.
4869 PhoneNET Connector 10-Pk *(DIN-8)* 198.
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6687 PhoneNET StarController-EN 1599.
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2307 Smartmodem 2400 349.
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6688 SoftPC for the Mac Portable 245.
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6265 2400EX with QuickLink II 195.
6650 2400EX MNP with QuickLink II ... 249.
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5858 Microsoft Mail 2.0 Workstation. 83.
5856 Microsoft Mail 2.0 Server. 245.
5857 Microsoft Mail 2.0 *(20 pack)* 965.
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6751 TurboNet ST *(12-Pack)*. 279.
5277 TurboBridge 319.
6272 NuvoLink SC. 319.
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4347 NetBridge. 339.
4942 TeleBridge 339.
3443 NetModem V2400 435.
6917 NetModem V.32 1429.
6519 EtherGate 1629.
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3455 MicroPhone II 3.0 215.
★Solutions, Inc. ... 60 day MBG
6721 MailMaker 5 User Pack 117.
4308 BackFAX *(reqs. Apple FAX modem)*. 124.
6720 FAXGATE Plus 239.
★Synergy ... 30 day MBG
6618 VersaTerm 4.1.1 88.
6619 VersaTerm-PRO 3.1.1 174.
★TOPS ... 30 day MBG
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7057 MacPrint TOPS Network Version 1.0 165.
6264 TOPS Networking Bundle 3.0 187.
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3729 LapLink Mac III Connectivity Pac.. 119.
6741 LapLink Mac III Network Pac. 185.

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6686 UPS 370ci 339.
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6719 Apple Portrait Display 899.
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6934 HL-8PS Laser Printer 3299.
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4476 OmniPage 2.1 539.
OmniSpell or OmniDraft ... *each* 69.
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6090 LabelWriter 185.
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1114 LaserWriter Plus Toner Cartridge. . . 99.
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5392 Disk Labels 3½"-*Laser (Qty. 630)* . . 29.
7049 Clear Labels 3½" x 15/16" *(Qty. 500)*. 17.
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2381 MacLuggage Macinware SE. 75.
6129 The Ultimate SE/Ext. Carrying Case 79.
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2589 Universal Printer Stand 15.
6722 LaserWriter II Security Kit 32.
4643 Mac II Stand and Cable Kit 64.
6895 Mac IIcx Monitor Stand. 54.
2579 Mac II Monitor Cable Extension Kit . 32.
2578 Extra Long ADB Keyboard Cable . . 24.
2545 Universal Copy Stand. 22.
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4972 Power Tree 10 19.
4973 Power Tree 20. 27.
4974 Power Tree 50. 54.
2559 Apple Security Kit. 33.
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★MacConnection ... 60 day MBG
4623 Solid Oak Disk Case *(holds 90 disks)* . 32.
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★Moustrak ... 60 day MBG
2694 Moustrak Pad *(standard 7" x 9")* . . . 8.
2692 Moustrak Pad *(large 9" x 11")*. 9.
2693 Moustrak Pad L/F *(9" x 11")* 10.
Ribbons
3255 ImageWriter II Ribbon Black 4.
3261 ImageWriter II Ribbon Multi-4-Color . 9.
3270 ImageWriter II Rainbow 6-Pack 20.
3260 ImageWriter LQ Black Ribbon. 17.
★Sopris Softworks ... 60 day MBG
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4014 High Trek Mac SE & Ext. Kybd. Case. 69.
5839 Mac IIcx CPU & Kybd. Carry Case . 69.
4862 SE Protection Pak *(ext. keyboard)* . . 75.
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3618 ImageWriter II Carry Case. 49.



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4015 Mac SE & Ext. Kybd. Carry Case . . 79.
6116 Mac IIcx Carry Case 85.
★Tripp Lite ... 30 day MBG
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6689 HP DeskWriter & ATM Bundle. . . . 889.
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2576 Turbo Mouse for Mac Plus 3.0. . . . 109.
2547 Turbo Mouse ADB 3.0. 109.
Koala
2593 MacVision 2.1. 219.
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6730 DICONIX M150 Plus Printer 489.
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4082 3-Button QuickStick ADB 49.
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5255 *Retrospect 1.1*–1989 MacUser Editors' Choice Award for *Best Backup Software.* "Retrospect can quickly store data on almost every backup medium. It also makes backup chores as painless as possible". $149.

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7152 19" Monitor for Mac SE/30 995.
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5138 Read-It! OCR Personal 2.1 124.
3034 Read-It! OCR 2.1 245.
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3036 Grappler *(9 pin)* 78.
6229 Grappler LX 129.
SAFE Power Systems
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1801 SCSI Interface/Port 109.
6727 MaraThon 030 Serial/Parallel 189.
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1809 MacSnap 524S. 239.
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6749 XM 3201 CD-ROM Drive. 899.

STORAGE MEDIA

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6148 3½" DS/DD Disks 3 Pak *(30)* 30.
3298 3½" HD Disks 1.44 Meg *(10)* 22.
6375 3½" HD Disks 3 Pak *(30)* 56.
6659 QD2000 40 MB Data Cartridge. . . . 19.

STORAGE MEDIA

MacinStor 650 HCV, THS-2200 and DATaVault

When it comes to massive storage and backup, these three products fill the bill.

Two of the driving forces behind the demand for increased hard-disk storage are desktop-publishing and photo-retouching packages, which create multi-megabyte files in no time flat. Fortunately, hardware vendors have kept up with the software so that users can quickly and easily build a system with several gigabytes of hard-disk storage.

With such mainframe-class storage requirements, backing up on floppy disks or even small, streaming-tape units would easily take a dedicated worker all day. Coming to the rescue is a new breed of tape-backup units that use helical-scan technology to record more than 2 gigabytes on an 8-millimeter video cartridge or more than 1 gigabyte on a 4-millimeter DAT (digital audiotape) cartridge.

MACINSTOR 650 HCV The Storage Dimensions MacinStor 650 HCV is a 650-megabyte (formatted) external disk drive built around the legendary Maxtor XT-8760S, one of the first high-capacity 5.25-inch Winchester disk drives. (Maxtor owns Storage Dimensions.) The drive, which is enclosed in a well-built cabinet measuring a svelte 7.25 x 4 x 15 inches, features an access time of 16.5 milliseconds, a maximum transfer rate of 15 megabytes per second, and an outstanding 40,000-hour MTBF (mean time between failures) rating. When tested with *MacUser*'s DiskBasher! benchmark program, the 650 HCV turned in a record-breaking 19.66 seconds. In comparison, the fastest, largest hard-disk drive that MacUser Labs tested for the February '90 lab report ("101 Hard Drives: Buyer's Guide"), the 90-megabyte Relax Hard 90 Plus, required 27.9 seconds for the same test.

TECMAR THS-2200 AND DATAVAULT In order to back up this large hard-disk drive, I turned to Tecmar's 2.2-gigabyte THS-2200 and its new 1.3-gigabyte DATaVault. The THS-2200 is built around an Exabyte 8-millimeter tape unit; the DATaVault uses a Wangtek 4-millimeter DAT unit. The THS-2200 is housed in a 5-x-9-x-12-inch enclosure, and the DATaVault enclosure is 7.11 x 4.0 x 14.75 inches.

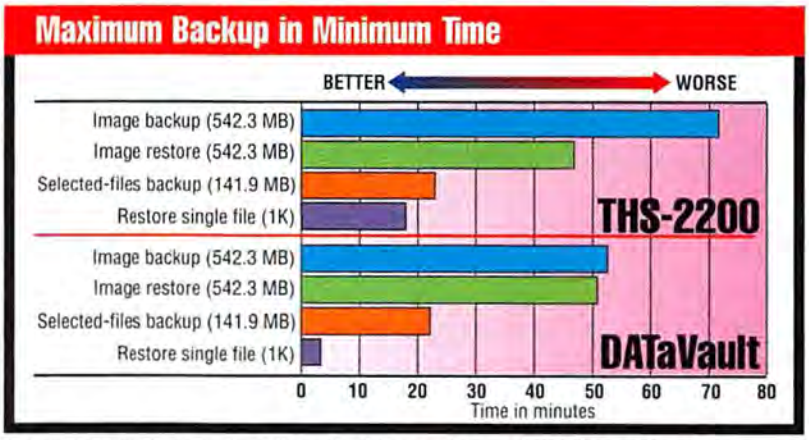
Both tape units utilize a recording technology called helical scanning, which Ampex pioneered in the 1950s for its first videotape recorder. Instead of moving the tape past a stationary read/write head, as is done in audiocassettes and 9-track computer tape, the tape is pulled from its enclosure and wrapped around a rotating drum that reads data from and writes it onto the tape in diagonal swatches.

In the case of the THS-2200, the tape moves past the head, which is rotating at 1,800 rpm at a speed of .429 ips (inches per second). This translates into an effective head-to-tape speed of 150 ips. The tape is written at an incredibly dense 43,200 bits (or 5.27K) per inch. The DATaVault, on the other hand, has a head that rotates at 2,000 rpm, and its effective head-to-tape speed is 123 ips. The drive writes data at an even higher density of 61,000 bits (or 7.44K) per inch.

The low-cost 8-millimeter videotape cartridges can be purchased in most department stores for less than $10, but the DAT tapes are in much shorter supply and cost more than $30 in the few record and stereo stores that carry them. The tapes have to be formatted before use, but that takes only a few minutes. Both kinds of tape can be ordered from Tecmar in quantity.

Tecmar's QTBackup software ships in the optional Mac accessory pack (the drives are designed to be platform-independent, so the interface kit determines whether you can connect them to a PC or to a Mac). This sophisticated software lets users back up a disk by using a complete image, selected files, modified files, or a partition method. The image backup is the fastest but does not allow users to select files when they restore backed-up files; the whole image must be restored to a disk of the same size as the original one. Selected file backups retain folder information, so users can restore a subset of files to a disk other than the original one.

QTBackup contains a sophisticated file-selection feature called PowerTag that lets users select files on their hard disk by matching a partial name, creation date, or file type and creator. Other powerful features of QTBackup are its automated scripts and MultiFinder-compatible automatic backups. After creating a script that tells the software which drive and files to back up, the user can schedule the backup



For huge backup jobs, such as those involving graphics and DTP files or file servers, Tecmar's DATaVault and THS-2200 are good choices. The DATaVault is faster than the THS-2200, but its capacity is only about half that of the THS-2200.

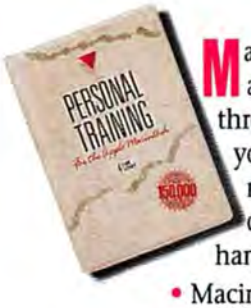
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job by using a calendar metaphor. After selecting a date, the user designates a time to perform the backup and sets a repeat interval (if any).

The one major drawback of QTBackup is that it does not include a feature that would allow users to create a printout of all the files in a "saveset." With 2 gigabytes distributed over as many as 170 savesets, finding a file can become a tedious task. The only mechanism that QTBackup has for logging files is a rudimentary, nonhierarchical journal file that is optionally created with each backup. It needs a more robust reporting feature.



If you deal with a lot of data, you should look into Storage Dimensions' MacinStor 650 HCV, a speed-record-breaking 650-megabyte hard-disk drive, and Tecmar's fast THS-2200 and DATaVault tape drives.

To compare the performance of the two drives, I performed an image backup and restore of 555,350K of data (542.3 megabytes), a selected-files backup of 3,600 files totaling 145,309K (141.9 megabytes), and a single-file restore from the eighth backup saveset on each tape.

The THS-2200 required 71.63 minutes for the image backup, compared with 52.6 minutes for the DATaVault (see the "Maximum Backup in Minimum Time" chart). These times indicate an average transfer rate of 129.21K per second (or 7.57 megabytes per minute) for the THS-2200 and 175.96K per second (or 10.31 megabytes per minute) for the DATaVault. The superior transfer rate of the DATaVault is due to its higher recording density. Restoring the image saveset required 47.71 minutes with the THS-2200 and 50.68 minutes with the DATaVault.

For the selected-files benchmark, the THS-2200 required 22.80 minutes, compared with 21.88 minutes for the DATaVault. Restoring a single 1K file from the eighth saveset on each tape required approximately 3 minutes for the DATaVault and about 19 minutes for the THS-2200. The time difference is due to the more sophisticated tape-indexing and search technology of the DAT unit.

Overall, I was able to get a total of 2,033 megabytes (2.0 gigabytes) onto the THS-2200 and 1,024 megabytes (1.0 gigabytes) onto the DATaVault. I noted only two operational problems with the DATaVault. The progress bar on the image backups did not function correctly with this drive, and the QTBackup software occasionally crashed after perfectly creating the saveset on a 2-megabyte Mac IIcx.

THE BOTTOM LINE

The Tecmar DATaVault combined with the MacinStor 650 HCV would make the ultimate Mac storage subsystem and be an ideal choice for a file-server and backup system. If several 650 HCVs have to be daisy-chained, the higher capacity of the THS-2200 tips the balance in its favor. Whether you deal with large files or a lot of little files, you should consider these units for your storage and backup needs.

— Jeffrey A. Steinberg

Get Info

MacinStor 650 HCV ★★★★

Manufactured by: Storage Dimensions, 245 Hamilton Ave., San Jose, CA 95125; (408) 879-0300.
List Price: $6,999.

THS-2200 ★★★★

Manufactured by: Tecmar, 6225 Cochran Road, Solon, OH, 44139; (216) 349-1009.
List Price: $6,495.

DATaVault ★★★★

Manufactured by: Tecmar, 6225 Cochran Road, Solon, OH 44139; (216) 349-1009.
List Price: $4,995.

Up to Date

Changes New and Noted

CLARIS CAD 2.0 is aimed competitively at Ashlar's Vellum. Claris' first major upgrade of its program boasts 100 new features, the most important being the inclusion of the Graphic Guide, an AI module that's similar to Vellum's Drafting Assistant. Like Drafting Assistant, Graphic Guide tracks mouse movements and reports on object geometry, so drawing tangents, finding midpoints, and performing similar functions are fast and simple. $899; upgrade, $79 for Claris CAD 1.0 owners, $499 for MacDraw II owners. Claris, 5201 Patrick Henry Drive, P.O. Box 58168, Santa Clara, CA 95052-8168; (408) 987-7000.

SUPER 3D has upgraded from version 2.0 to version 2.1. Among the new features are VersaCAD file conversion; support for 32-bit QuickDraw; and improvements to the program's modeling, rendering, and animation capabilities. Frame-by-frame animation playback is now supported. $495; upgrade, free to registered owners of 2.0. Silicon Beach Software, 9770 Carroll Center Road, Suite J, San Diego, CA 92126; (619) 695-6956.

TIMBUKTU 3.1 now lets users view and control multiple Macs in resizable windows. The windows continue to update, regardless of whether that particular Timbuktu session is the active window, so activity can be monitored continually. Farallon has increased point-to-point file-transfer speed between three and seven times and has made improvements to the interface. $149 (single user), $1,995 (30-pack); upgrades, free to registered owners of 3.0. Farallon Computing, 2000 Powell St., Suite 600, Emeryville, CA 94608; (415) 596-9000.

SAM (SYMANTEC ANTIVIRUS FOR MACINTOSH) has been upgraded to version 2.0. This version includes an instant-update feature that lets users add new virus protection simply by calling Symantec's 24-hour Virus Newsline. SAM 2.0 also automatically scans and ejects infected floppy disks and provides automatic protection against virus clones once the virus family is known. Users can also specify up to five folders for instant scanning via hot keys, a useful feature for on-line users. $99.95; upgrades, $29.95 to registered owners. Symantec, 10201 Torre Ave., Cupertino, CA 95014-2132; (408) 253-9600.



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CAD

Blueprint

The maker of MiniCad now has a solid entry in the low-priced-CAD market.

Blueprint is a 2-D-CAD program with features that, as the name implies, are particularly useful for architectural drafting. The program takes up only 590K on a hard disk and runs comfortably with 1 megabyte of RAM, making it a good choice for users on a budget.

DRAWING TOOLS Blueprint opens to an uncluttered display with a fixed-size drawing window, two floating tool palettes, and a menu bar with some unusual symbols. One palette is a standard set of drawing tools, and the other is a set of constraints that modify these tools. One menu heading, a delta symbol (Δ), includes items for changes (rotate, move, send, align); another menu (headed by the cryptic symbol = =) includes items for layering, grouping, assigning classes, and creating symbols. These are the same menu markers Graphsoft uses in Azimuth (see April '90, page 76) and MiniCad+ (see December '89, page 67), which makes these symbols consistently nonstandard in all Graphsoft products.

Blueprint's drawing window, unlike those of many Mac drawing programs, does not have scroll bars. Instead you use the "pan" tool (a hand cursor) to grab your drawing and shift it around. You use arrow keys to jump up or down, or left or right, half a screen at a time. The screen automatically scrolls as you draw beyond its edges. Zooming is simple: Click on the Zoom In or Zoom Out icon, and drag a rectangle around any desired area to reduce or enlarge it by a factor of 2. There are keyboard shortcuts and modifiers to change the zoom factor to 4, but there is no on-screen indication of the current magnification — an omission I found incomprehensible; you should always know your current viewing size, especially in a CAD package. This is made worse by the absence of any rulers at the edges of the drawing.

Blueprint supports one geometric entity that is missing from many drawing programs: the point, or locus. It is particularly useful for surveyors, cartographers, and other drafters who work with precisely located reference points. You can snap any object to a point, which makes working with reference points easier.

Blueprint's treatment of color ranks with the best I have seen in any drawing program. With an 8-bit-video card you have access to the system palette of 256 colors. Colors can be separately assigned to the outline of an object, its solid fill, or the foreground and background of any monochrome fill pattern. There are 72 fill patterns; 36 of them can be edited and changed — they're saved along with the drawing. You can also assign one color to all the objects on a layer. Unfortunately, the beautiful color palettes are stuck two levels down in a hierarchical menu — they would be easier to use if they were tear-off or floating palettes.

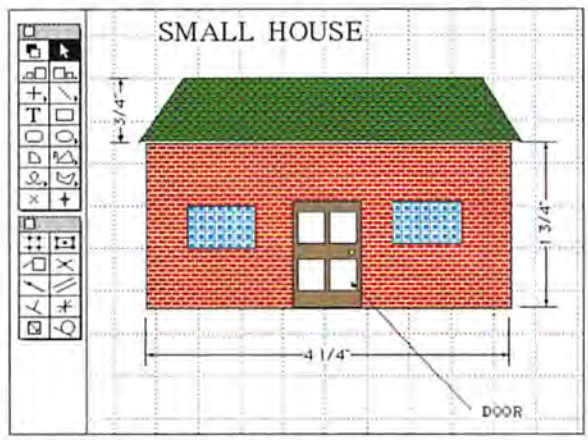
Along with a number of layers limited only by your available RAM, Blueprint lets you create and manipulate object "classes." Dimensions are a class by default, but you can create classes such as "electrical fixtures," "hex nuts," or "parking lots." You can hide or gray out members of a class by using easily accessible dialog boxes.

Dimensions in Blueprint are not associative; that is, the text does not automatically change when you resize the object it refers to. Dimensions are "autosized," however; if you select the dimension as well as the object when you resize, the dimension text will reflect the change.

GETTING IT ON PAPER Blueprint supports very high precision, both for the drawing itself and on the output device. On a Linotronic or similar imagesetter, the program can deliver resolution of up to 2,400 dpi. Since the standard PICT format cannot save data with such precision, Blueprint also offers the option of exporting drawings in EPSF, so your drawings can be pasted directly into page-layout programs without distortion or loss of accuracy — a real plus.

The MiniCad plotter drivers designed to work with Blueprint are sold as a separate $300 package, which saves money for users who do not intend to use a pen plotter (although some competing products include plotter drivers free). On the other hand, a DXF translator (which imports or exports drawings in the format used by AutoCAD) is built into Blueprint at no additional cost.

Blueprint ships with a 330-page user manual in a three-ring binder and two disks of sample files and symbol libraries. The manual provides a glossary and a comprehensive index, but its pagination is confusing (for example, 3A.34b, 3A.7, 3H.17, 4.11).



Blueprint is a midrange 2-D-CAD program from Graphsoft, maker of MiniCad+. Its control over colors as well as pattern fills is excellent. It's reasonably priced and performs well even on 1-megabyte machines.

THE BOTTOM LINE In the category of low-cost (less than $800), Mac 2-D-CAD programs designed to run on systems with only 1 megabyte of memory, there are many excellent products: Canvas 2.1, Dreams, and PowerDraw, for example. Blueprint is a newcomer that deserves serious consideration.

— Mike Markowitz

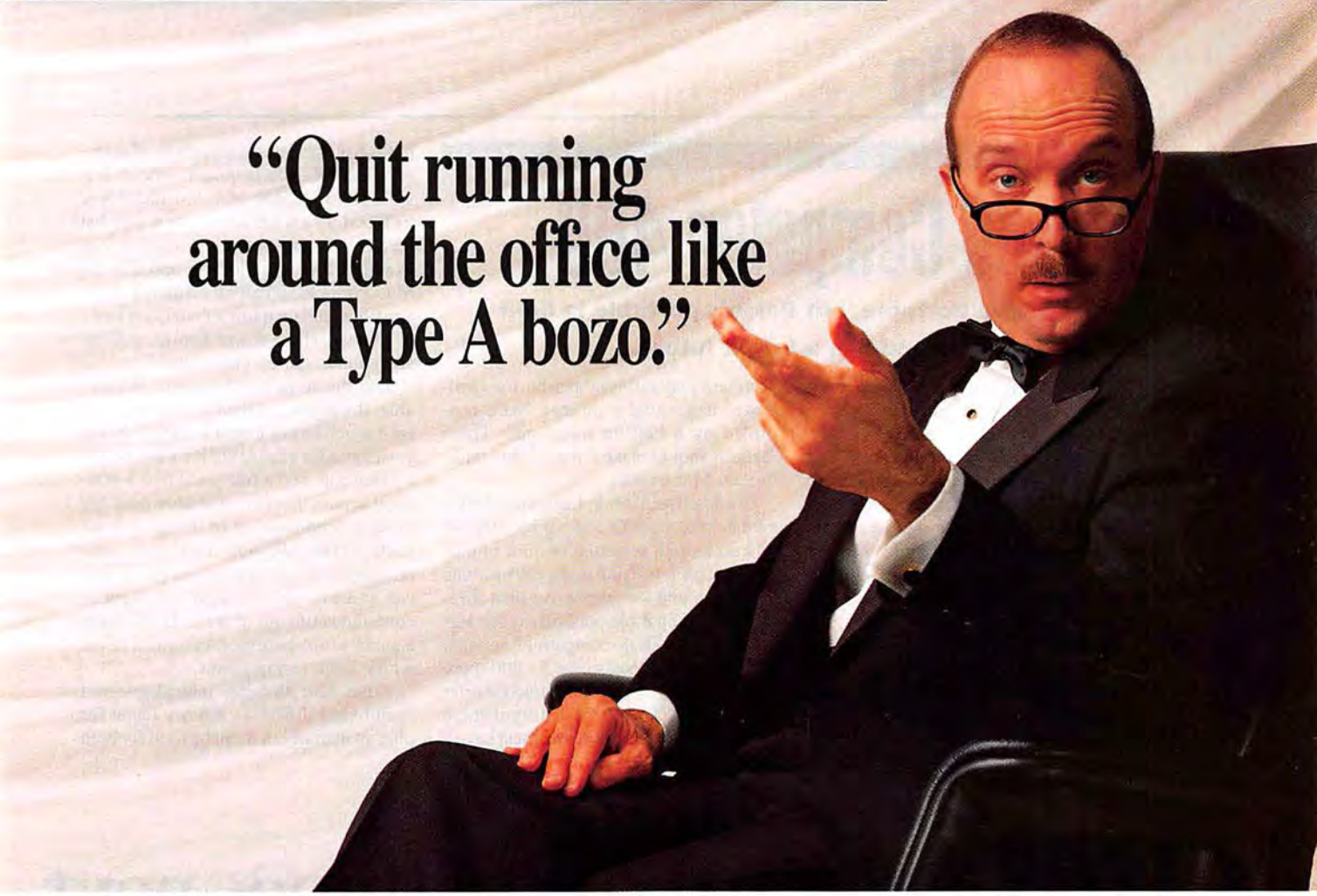
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Blueprint ★★★★

Published by: Graphsoft, 8370 Court Ave., Suite 202, Ellicott City, MD 21043; (301) 461-9488.
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"QuickMail is simple, yet rich. People enjoy using it, so they use it more. Good. Whether you're sending mail around your LAN or around the world, QuickMail makes it so fun and easy, people will cut down on time spent playing games, and get some real work done."

"Don't settle for feature-wimpy mail. You'll outgrow it."

"QuickMail gives you true store-and-forward technology, real-time conferencing, custom forms, a mail log, wide area connectivity, access to mail from laptops or terminal packages, easy-to-use, automated gateways to the public networks like MCI Mail™, UNIX® mail, AppleLink® and more. Others talk about gateways. We've been delivering for months. (Beware of companies with Edsels in their ads.) You won't outgrow QuickMail. Apple uses it. NASA uses it. Every major Macintosh® publication uses it. You can't go wrong."

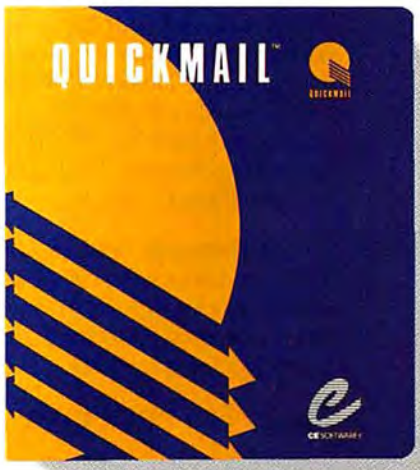
"Want a second opinion? Ask the critics."

"As we said before, CE Software's QuickMail is the best electronic mail package on the Mac, and the latest updates have only increased its lead over Microsoft Mail and InBox." MacWeek, 8/8/89

"Rather than exercising 20-20 hindsight, start out with QuickMail." Dave Kosiur, Connections, July-August/89

"Go to a dealer and try it."

Versions for the Macintosh and PC.
Suggested retail price: Version 2.2, 10 user pak: $499.95
Free literature and Where To Buy: 1-800-523-7638 Dept. CE22.



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StartUp

HARDWARE

Mobile Computer 400

It isn't a Mac Portable, but Psion's portable is light and inexpensive and has a bright future.

The Mac Portable is a fine technological accomplishment, but it's not what every Mac owner needs in a portable computer. It's too heavy and bulky to carry everywhere and too expensive for most of us, which is why many people have had to search for non-Mac alternatives if they want a portable machine. But making do without Mac compatibility doesn't mean abandoning a Mac-like interface entirely.

GET UP AND GO Psion, maker of the first mass-market hand-held computer, has now come out with a machine that's portable enough to carry around with you — and it's relatively cheap as well. It has a proprietary operating system but uses pull-down menus and a pointer that's controlled by a built-in touch pad. These features should make it reasonably intuitive for Mac owners.

Because the Mobile Computer 400 is neither Mac- nor PC-compatible, it has to rely on a small selection of built-in programs. This lets Psion make the machine less heavy and less expensive than similar DOS-compatible portables (even less than its own DOS-compatible version, MC-600, which costs over $1,000 more than the MC-400 and has a much shorter battery life). To be really useful these days, a DOS or Mac portable must have a hard-disk drive and a megabyte of memory. The MC-400 is quite usable as it is with just its 256K of RAM and 256K EPROM. Psion has added a few unusual features to the operating system. For example, it is multitasking, and like the Mac Portable, it can be switched off at any point and then immediately on again to exactly where it was before, without any tedious startup procedure.

The machine itself is quite remarkable. It weighs less than five pounds and isn't much larger than a hardback book, yet it includes a full QWERTY keyboard, a touch pad, and a full-sized 640-x-400-pixel screen that is remarkably readable in most conditions, even though it's not backlit. The MC-400 uses eight non-rechargeable AA batteries for power and can squeeze an estimated 60 hours of continuous life out of them. If you carry a spare set of batteries, you need never worry about losing power.

It has four slots for matchbox-sized "solid-state disks" — a fancy name for plug-in memory that can be used for both

HP offers you the best things next

From input to output, Hewlett-Packard leads the way. With a full line of Mac-compatible printer and scanner choices.

For photographic-quality scanning, there's the HP ScanJet Plus scanner. Combine that with one of HP's high-quality printers. The DeskWriter, the new LaserJet III, the LaserJet IIP, or the LaserJet IID. HP even has color printers. The PaintJet and the PaintWriter XL.

Plus, HP stands behind all their products with exceptional service and support. And a one year warranty. It doesn't get much better than that.

There is a better way.



HEWLETT PACKARD

Please circle 388 on reader service card.

storage and work space.

In addition, the MC-400 has two expansion slots in the back for various peripherals. These include a 2,400-bps modem and a "voice processor" that Psion boasts will offer CD-quality audio recording with a high level of real-time compression/decompression. Psion claims you can store ten minutes of speech in 64K of memory, or almost three hours of speech in a megabyte.



Psion's Mobile Computer 400 isn't Mac-compatible, but it packs a familiar-looking interface. It's light and inexpensive and will soon offer a Mac link and a Mac-compatible 3.5-inch external floppy drive. If you can't afford a Mac Portable, the MC-400 is a good alternative.

GOT UP AND WENT Unfortunately, despite the many interesting future developments predicted for the Mobile Computer, its present lack of software limits it. Since no third-party software is currently available, the MC-400 lacks some important programs: A spreadsheet program won't appear until about the time you read this (at the earliest) and a full-featured word processor is not due until the fall of this year. (Psion has plans to bundle the spreadsheet and word processor with the MC-400 around the end of 1990, but no formal plan or schedule has been announced.) The MC-400 ships with a diary that has alarms, a simple text editor, a basic terminal program, OPL (Psion's own BASIC-like programming language), a calculator, and a Rolodex-style database manager that can access some of the functions in OPL. The MC-400's CPU, a 7.68-megahertz 80C86 — a speeded-up version of the chip found in the original IBM PC — is another limiting factor.

The Mac-Psion interface was still in development at press time (it's scheduled for a fourth-quarter release), but I understand that it will be run from the Mac and will resemble Apple File Exchange or the Font/DA Mover in operation, showing the Mac's files on one side and the MC-400's on the other. If the MC-400 proves a big success among Mac users, Psion will pay more attention to the Mac link, perhaps by providing a HyperCard-based interface that would allow two-way sound transfers and diary entries, as well as text. For the moment, the only way to transfer files is via a telecom package. More alternatives are on the way, though — in addition to the Mac Interface Cable and software, Psion will also be offering a

to your Macintosh.



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StartUp

Mac-compatible 3.5-inch floppy drive that can be used for direct transfers.

THE BOTTOM LINE Many of the benefits of the MC-400 are still to be seen, but the basic package remains attractive. For the price, I have seen nothing better for portable note taking, writing, and personal organization. It may not be a Mac Portable, but it could be the next-best thing.

[*The MC-400 is currently pending FCC approval for sale in the U.S.; approval is expected by the time you read this review. — Ed.*]

— Charles Forster

Get Info

Mobile Computer 400
★★★★
Manufactured by: Psion, 118 Echo Lake Road, Watertown, CT 06795; (203) 274-7521.
List Price: $1,795.

MATHEMATICS

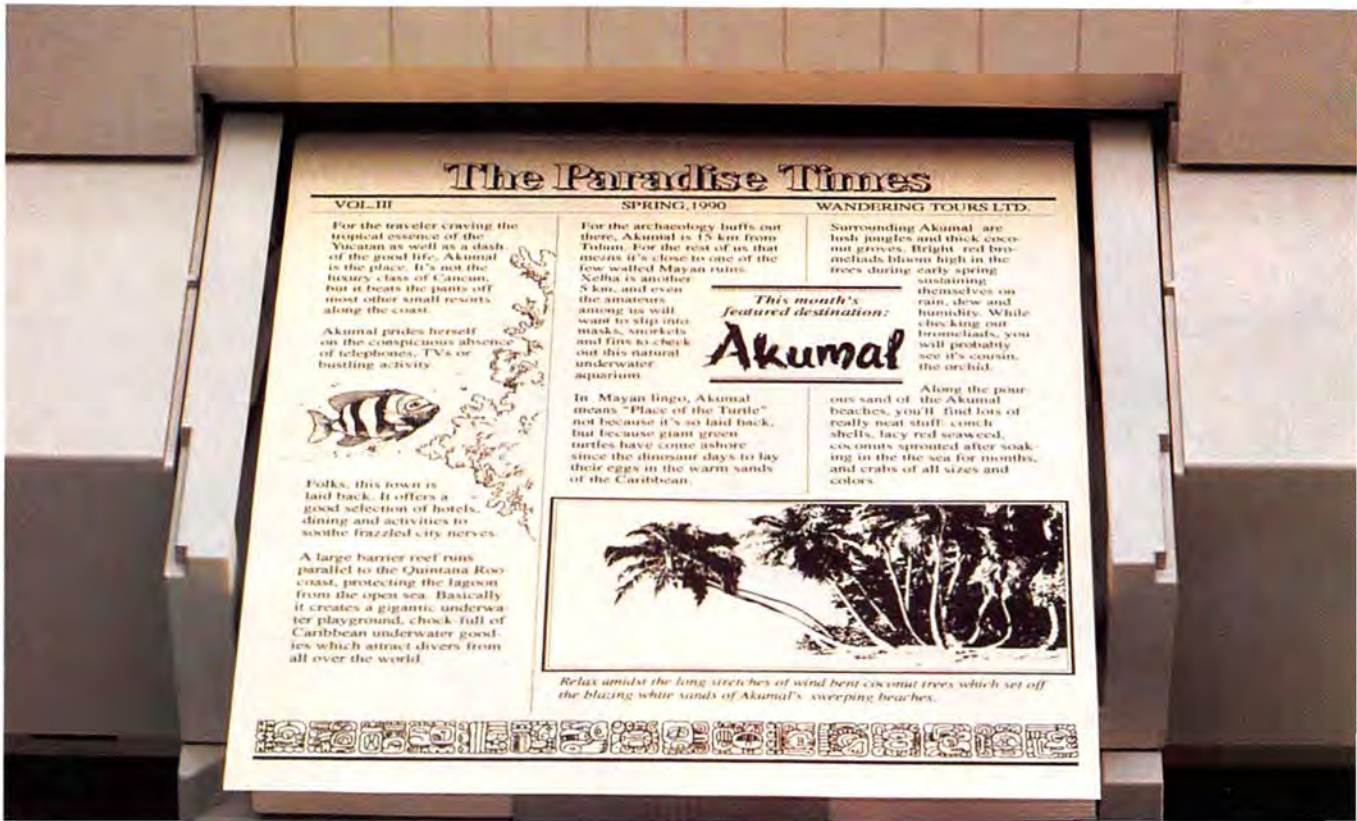
Formulator, MathType, Expressionist, and Milo

A quartet of equation writers makes for a crowded field, but Milo is tops.

Formulator, MathType, Expressionist, and Milo are all designed to make writing mathematical expressions easy. The first three are intended primarily as expression writers; Milo is also an evaluator and small-scale word processor. None have the complexity of the big mathematical programs such as Mathematica or the statistical and graphing capabilities of DataDesk, but each has advantages, depending on what you want to do.

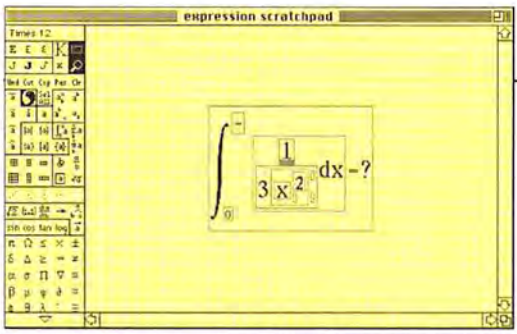
EXPRESSIONIST AND MATHTYPE Expressionist and MathType can be installed either as applications or as DAs; if you install the MathType DA, however, the application must be installed as well, because the DA actually accesses it. Expressionist has a large (110K) but self-contained DA that has all the capabilities of the application. Both programs have a palette of small icons for most nonalphabetic expressions.

With the HP DeskWriter, you can



*Relax amidst the long stretches of wind bent coconut trees which set off the blazing white sands of Akumal's sweeping beaches.

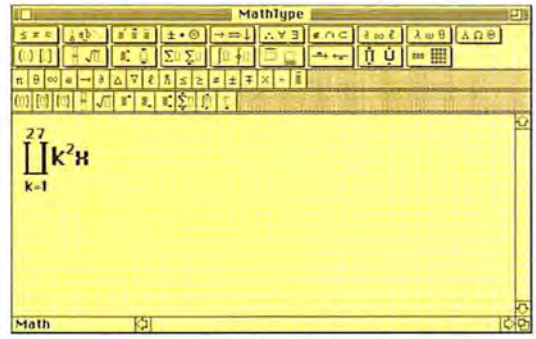
*Suggested U.S. list price. © 1990 Hewlett Packard Company. PE12805
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Microsoft is a U.S. registered trademark of Microsoft Corp.
PageMaker is a U.S. registered trademark of Aldus Corporation.



Expressionist is an equation-writing DA and application that's more flexible than MathType and comes with excellent documentation. Its screen can get confusing, with boxes around all the places you can add to your equation — fortunately, this feature is easy to suppress.

MathType lets you select the palette that appears across the top of your screen. The default has a section of template reminders (each with its own "list" available) and a section of common operators. When you switch between MathType's window and your word processor's, the menu bar automatically switches too — a very attractive feature that makes matrix creation easy. As a DA, MathType beats Expressionist in most ways, but it has its disadvantages. It incorporates "the rules of mathematical typesetting" into whatever you do, which can make it hard to set integrals with words that contain common operators, such as "lim" or "sin." You can work around the defaults, but if you use a lot of equations that contain words, you might not want to take the time.

Expressionist, from Prescience (formerly Allen Bonadio Associates), on the other hand, does not assume that you will want to follow any specific approach. On-screen, Expressionist puts the palette along the side. This palette is three standard SE-sized screens deep, but you can't scroll through the length of it. Instead, you click on a button that shows you one screen's worth at a time, which is not particularly convenient. Standard expressions are mostly in the first screen, however, and the second and third are devoted to Greek letters and less-common operators. Saving equations is a nonintuitive process that takes six steps and involves cutting and pasting your work into a new document. Expressionist comes with exceptional documentation; instead of an



MathType comes as a DA and an application, and for general use, it's better than Expressionist. In MathType, clicking on one of the icons in the upper rows opens a menu of related templates, allowing easy generation of complex expressions.

have it all. (But keep it to yourself.)



The HP DeskWriter printer puts laser-quality printing right at your fingertips.

With a small size and a $1,195* price tag, the DeskWriter printer easily fits on your desk and in your budget. And its advanced 300 dpi inkjet technology lets you print sparkling text and detailed graphics.

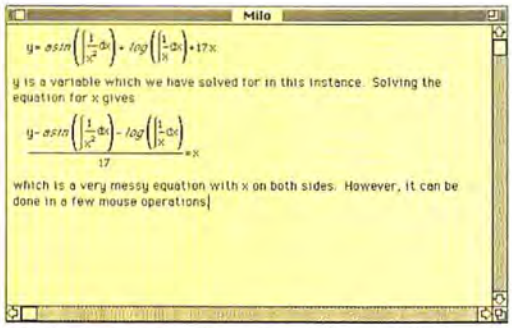
The DeskWriter is also designed for easy use with your Macintosh, and has both serial and Apple Talk interfaces. It even includes scalable and outline fonts. Combine that with the DeskWriter's whisper-quiet operation, and keeping it to yourself will be that much easier. So call **1-800-752-0900, Ext. 1004** for your authorized HP dealer.

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StartUp

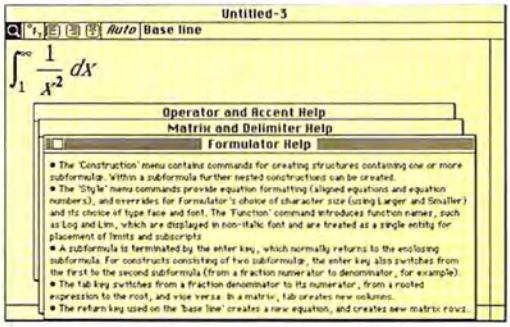


Milo is an equation writer and evaluator, and it's a good choice if you need to combine text and equations but don't need the power of a big math-cruncher program such as Theorist.

index, you get an encyclopedia that gives you all the relevant information under the entry (including "see" and "see also" cues).

FORMULATOR AND MILO Formulator (see Bobker's Dozen, October '89, page 288) and Milo are applications, not DAs. Each incorporates a rudimentary word processor as well as an equation writer, so toggling between equation generation and text editing is easy. Formulator is similar to Expressionist and MathType, with fewer typesetting rules and significantly more training help. It comes with a HyperCard demonstration stack that makes it easy to get started, and the section on carrying equations into a word-processing program is very clear.

Milo is the most flexible of all the programs, as it's really a general mathematics program that's far from being just an equation writer. It lets you include text blocks of up to 32K (the equivalent of 17 double-spaced pages) in text fields, and there's no limit to the number of text fields you can include in a document. For most purposes, this is adequate. If you want to put one equation into a larger document, you can cut and paste. Milo also includes numerous tables of interesting financial, physical, and astronomical relationships. In addition, it graphs equations, simplifies them, and does number crunching. Milo's greatest advantage for equation writing is its tutorials. Paracomp supplies four "guided tours" and five tutorials on the disk (the



Formulator is functionally similar to MathType and Expressionist but with fewer typesetting rules. Its HyperCard demo provides a good introduction, but its on-screen help isn't very clear and doesn't make equation writing easy.

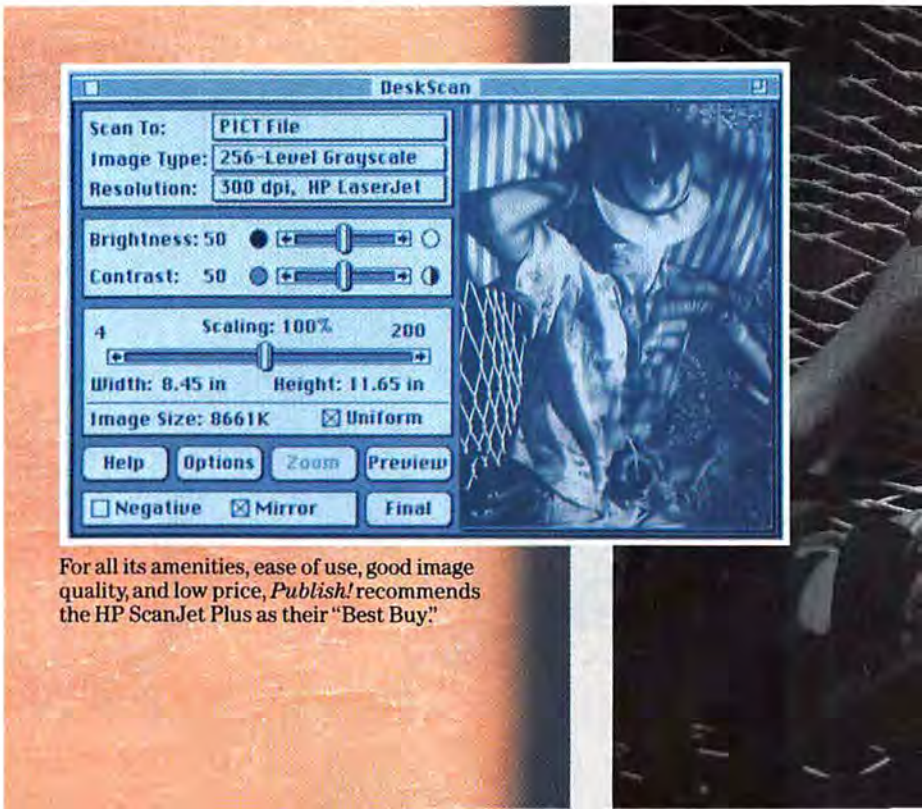
With the HP ScanJet Plus, you've

The HP ScanJet Plus scanner provides 8-bit photographic-quality scanning.

That means 256 shades of gray for the hottest-looking output from your Mac. And it's so easy, too. At the click of a mouse, you can get negative or mirror images, as well as scaling in 1% increments from 4-200%. All for $2,190,* about what you would expect to pay for a 4-bit scanner.

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For all its amenities, ease of use, good image quality, and low price, *Publish!* recommends the HP ScanJet Plus as their "Best Buy."

HEWLETT PACKARD

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tutorials are duplicated with more detail in the manual), all of which run under Milo. These help you understand the mind-set of Milo's creators and make final copy a lot easier to generate. Paracomp tends to use a little more jargon in its documentation than the other three companies, but the difference is slight. And its support people are the friendliest on the telephone.

THE VERDICT For writing a lot of equations that can be pasted into word-processing files, MathType is best for general use; for word-oriented applications, Expressionist is more flexible and has the best printed documentation by far. For mathematical-manuscript production, for which you're willing to put in a fair amount of time learning a system you can stay with, Milo is easier to learn than Formulator, has much more training material than any of the other programs, and is the easiest for mathematically semisophisticated users. Its printed documentation is less useful than that of Formulator or MathType. The tech-support people at all the companies were available, intelligent, and helpful when I called them. Paracomp also has a bulletin board and newsletter for registered users, making it much easier to get in touch with the company at unusual hours (although you may have to wait until business hours for a reply — BBSs work 24 hours; people don't).

THE BOTTOM LINE If I could have only one equation writer, it would have to be Milo, with Expressionist a close second. All the programs are adequate; Milo and Expressionist are the most useful.

— Tom Whitmore

Get Info

Expressionist ★★★★

Published by: Prescience, 814 Castro St., San Francisco, CA 94114; (415) 282-5864.
Version: 2.03.
List Price: $129.95.

Formulator ★★★½

Published by: ICOM Simulations, 648 S. Wheeling Road, Wheeling, IL 60090; (708) 540-4440.
Version: 1.1.
List Price: $149.95.

MathType ★★★½

Published by: Design Science, 6475-B Pacific Coast Highway, Suite 392, Long Beach, CA 90803; (213) 433-0685.
Version: 2.11.
List Price: $149.

Milo ★★★★½

Published by: Paracomp, 123 Townsend St., Suite 310, San Francisco, CA 94107; (415) 543-3848.
Version: 1.0.
List Price: $249.

got it made in the shades.



*Suggested U.S. list price. © 1990 Hewlett-Packard Company PE12004

BetaWatch

Products on the Horizon

FileMaker Pro is the fourth iteration of the popular flat-file database. In addition to its new name, FileMaker Pro boasts 100 new features, with particular improvements in its reports, multi-user functions, and scripting. Layouts can now be named and are available in the Browse mode. The Layout mode includes an 8-bit-color draw environment; MacPaint, PICT, EPSF, and TIFF graphics are supported, as are radio buttons and check boxes. Also, any graphic can be a button that either triggers a script or performs any FileMaker Pro function. There are now 83 built-in calculation functions, and mandatory fields are supported. Zooming from 25 to 400 percent is available in all modes. FileMaker Pro also offers users greater control over imported files. With an interface that's similar to that of the Font/DA Mover, users can specify which fields in the imported file should be matched to which fields in the FileMaker Pro file. Users also have much greater control over file-access privileges, including creating work groups and accessing control down to the individual field level.



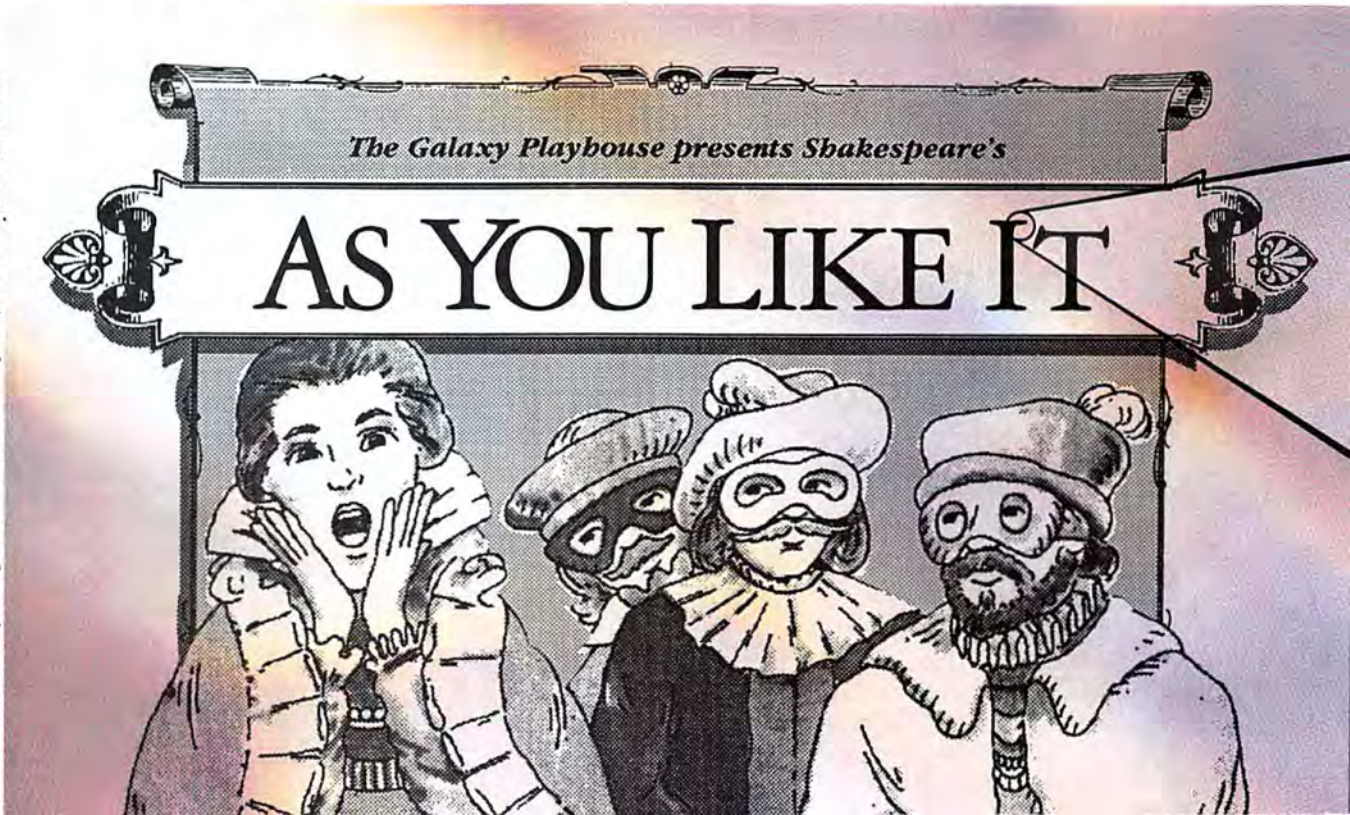
$299; $99 for any registered owner of FileMaker II or IV. Claris, 5201 Patrick Henry Drive, P.O. Box 58168, Santa Clara, CA 95052-8168; (408) 987-7000. ETA: June '90.



Electric Image is a high-end 3-D-rendering and -animation package that has played a big part in Apple's demonstrations of the high-end power of the new Mac IIfx. Users import images from one of many 3-D modeling programs and then add attributes including shading, transparency, luminance, reflectance, color, and texture. Objects can be shaded according to flat, Gouraud, and Phong models. Resolutions can range from 32 x 32 to 4,000 x 4,000 pixels, and animations can be previewed on-screen in real time.

$7,595. Electric Image, 9690 Telstar Ave., Suite 225, El Monte, CA 91731; (818) 444-1819. ETA: June '90.

With the HP LaserJet III, you can



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UTILITIES

After Dark and Pyro! 4.0

The two top screen savers can keep your Mac interesting, even when you're not doing anything.

The two leaders of the screen-saver pack are After Dark and Pyro!, and new versions of both have just been released. Both offer numerous modules, so your idle screen can be as exciting or as busy as you want. Both are excellent utilities.

AFTER DARK After Dark was the first screen saver to use drop-in modules that allow you to pick what appears when your screen is idle. The current version comes with 18 modules.

New modules are being released on MAUG (the Mac area of CompuServe). As of press time, there was an After Dark version of the Moiré screen saver and of Shredded Crystals.

PYRO! 4.0 Early versions of Pyro! had only its trademark fireworks and a clock. The current version has 12 modules, and you can select as many of them as you want. Each time it engages, it displays a different module, although you can specify one to be the primary module. The first additional Pyro! module, Flashlight, is being finished as this review goes to press.

THE VERDICT The external appearance and effects of these two programs are more alike then different. You control both Pyro! and After Dark via the Control Panel. After Dark takes about 50K to start up and then an average of 8K after that, depending on which module you're using. Pyro! uses up 38K of memory. Both sets of controls are intelligent and nicely done, but Pyro! has better options for engaging and disengaging. Both have manuals that are clear enough for beginners and complete enough for experienced users. The After Dark manual contains information for programmers who want to develop their own modules, and both programs come with a folder of development examples.

Each program has an option for locking the screen with a password when the program becomes active. I'm not a fan of such slight protection, but it's only an option, not a mandatory feature. And some people really like it.

The extensive features lists that both programs sport bring up the question of whether you really need so many features and choices in a screen saver. After all, these aren't productivity tools, and the modules don't add anything except choices and variety.

The current version of After Dark has

refine your characters.



Introducing the HP LaserJet III printer. With breakthrough technology that delivers the most refined 300 dpi print quality ever. It's easy to use and comes with Adobe® PostScript® and AppleTalk interface. So the LaserJet III is completely compatible with your Macintosh.

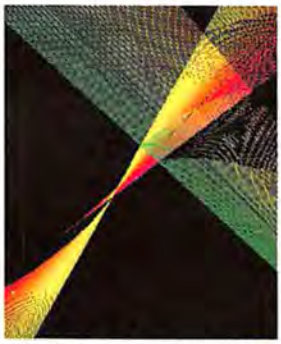
HP offers other LaserJets with Adobe PostScript software. The LaserJet IID printer with increased paper-handling capability. And the affordable LaserJet IIP printer. For character-building information and the name of your nearest authorized HP dealer, call **1-800-752-0900, Ext. 1168.**

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StartUp



After Dark was the first screen saver to use a modular approach. It's just been upgraded and includes this beautiful String pattern.



Pyro! 4.0 has followed After Dark's lead and adopted a modular approach. In the Aquarium module, the big fish eat the little ones.

behaved reliably. The previous version of Pyro! was rock steady, and this version seems equally stable. Pyro! handles background tasks better than After Dark, and that's important if you do a lot of printing or downloading of data from other computers. Pyro! can automatically switch to simpler modules when the background load is heavy.

You can probably run both Pyro! and After Dark at the same time, but that isn't a good practice. If one is set to activate before the other, you'll just be wasting disk space with the one that never gets used. If both are set to activate at the same time, the results are unpredictable and could prove undesirable.

THE BOTTOM LINE You won't go wrong with either of these utilities. After Dark has more modules, but with the exception of Puzzle, I prefer Pyro!'s modules. They are more interesting visually. Pyro!'s Aquarium, which is a bit of a memory hog, is the best of all the modules, and Pyro! has better control options.

I've never had any problems with Pyro! and have experienced only insignificant difficulties with the new version of After Dark. If you have version 1.0 of After Dark, you can obtain a slick free upgrade package from user groups, BBSs, and national on-line services. Pyro! upgrades cost $15 from the publisher.

— Steven Bobker

Get Info

Pyro! 4.0 ★★★★★

Published by: Fifth Generation Systems, 10049 N. Reiger Road, Baton Rouge, LA 70809-4559; (800) 873-4384 or (504) 291-7221.
Version: 4.0.
List Price: $39.95.

After Dark ★★★★½

Published by: Berkeley Systems, 1700 Shattuck Ave., Berkeley, CA 94709; (415) 540-5535.
Version: 1.1.
List Price: $39.95.

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Rumor Manager

Gossip, Guesses, and Goings-On

Color displays are in a state of flux, with exciting developments underway on two fronts.

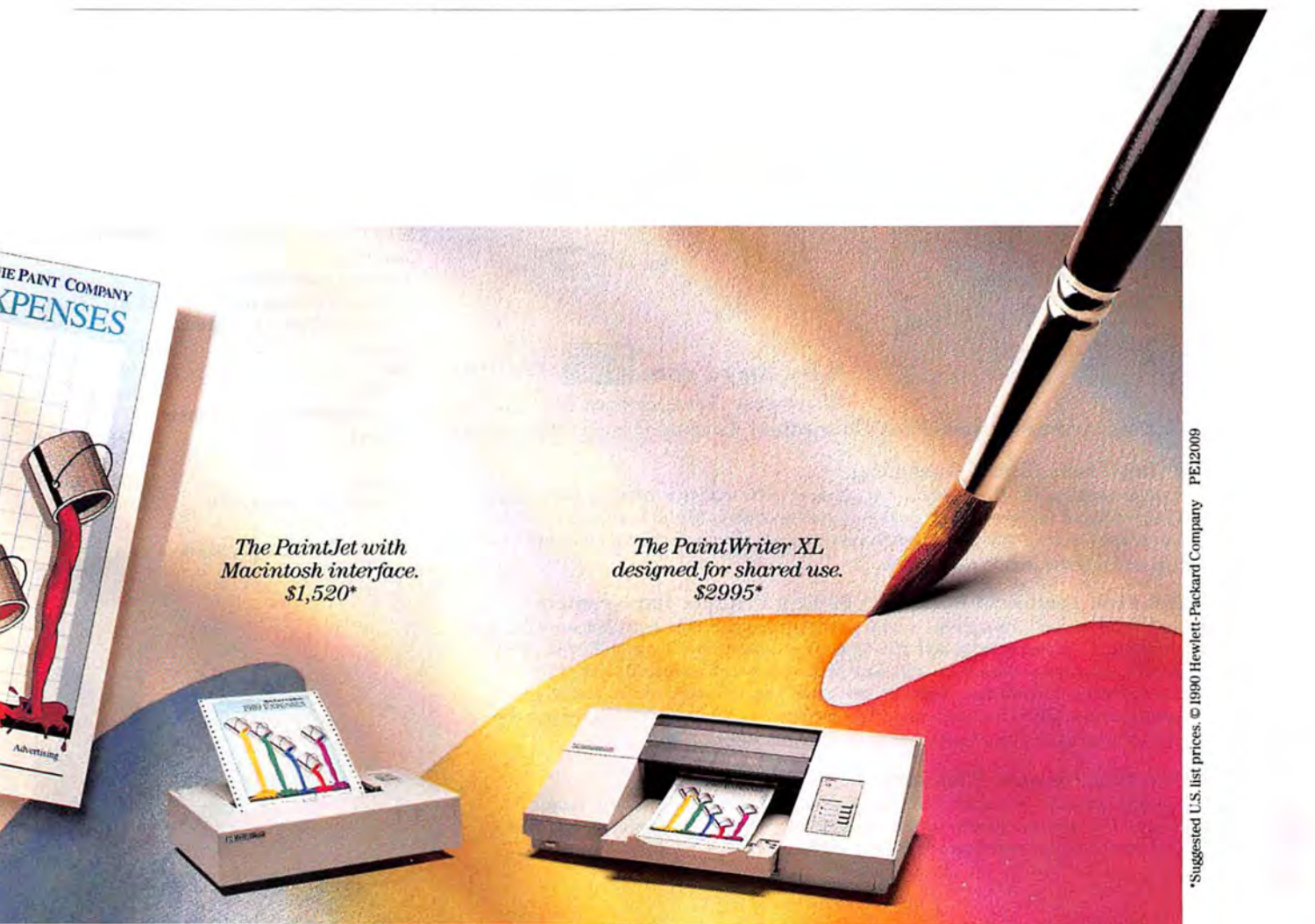
In the purely physical realm, the long-awaited portrait-mode color display is coming. But most observers will be surprised to see that it'll be coming from across the Atlantic, not from across the Pacific. A French CRT maker has developed a new technology that, for the first time, makes relatively small production runs feasible. The prototype quality is said to be better than that of Sony's Trinitron.

Apple is known to be negotiating for exclusive rights to the first 500,000 units, but several other West Coast monitor makers are also in on the bidding action. That might result in relatively expensive units. But then again, it might not. The CRT manufacturer has invented not only a better technology but also a much cheaper one. It would like its initial foray in the U.S. market to involve a lower-priced unit. The idea is to get some very favorable press so it can move into the much more lucrative commercial television-set market.

A bit further off, but still very important, is the invention of a color inert-gas-plasma screen whose pixels are small enough that it can work with a Mac. The maker is a large Japanese electro-optical giant. Previous plasma-based designs have been too slow and have required far too much power to be really practical. This new unit was actually designed from the beginning to run off small, user-replaceable batteries (four AAs last three hours, we hear), which would mean a screen with a power supply independent of the CPU, making the screens practical for laptops. The speed has been brought up to snuff by use of some very expensive rare-earth components. Since the image is plasma-driven, there's no radiation of any kind. The final feature is the thickness of the unit: three-quarters of an inch. It sounds almost too good to be true. There are, however, some serious problems to overcome. One is unexpected and, for the moment, unexplainable radical color shifts. Price, based on the prototype, is astronomical. A Ferrari would be cheaper. And no one yet knows if mass production is even possible.

■■■■

Our U.S. mail address is Rumor Manager, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Our electronic addresses are MacUser (on MCI Mail), 70411,204 (on CompuServe), and MacUser.Edit (on AppleLink). No calls, please.



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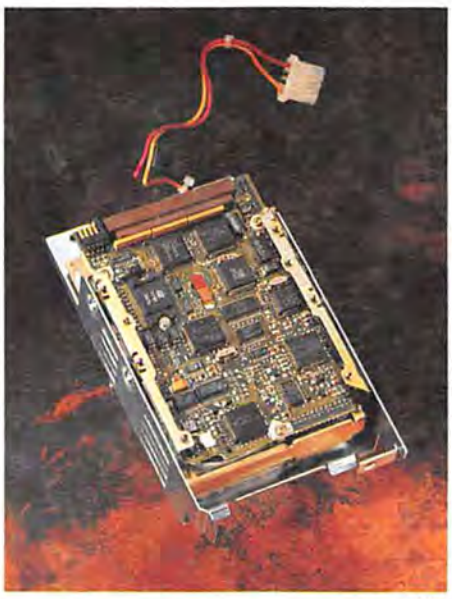
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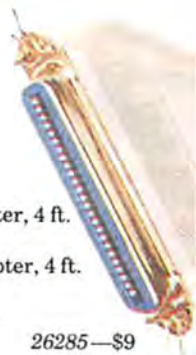
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MAIL CALL

Five contenders spar for the title of electronic-mail champ.

BY MICHAEL MILEY AND THE MACUSER NETWORKSHOP STAFF

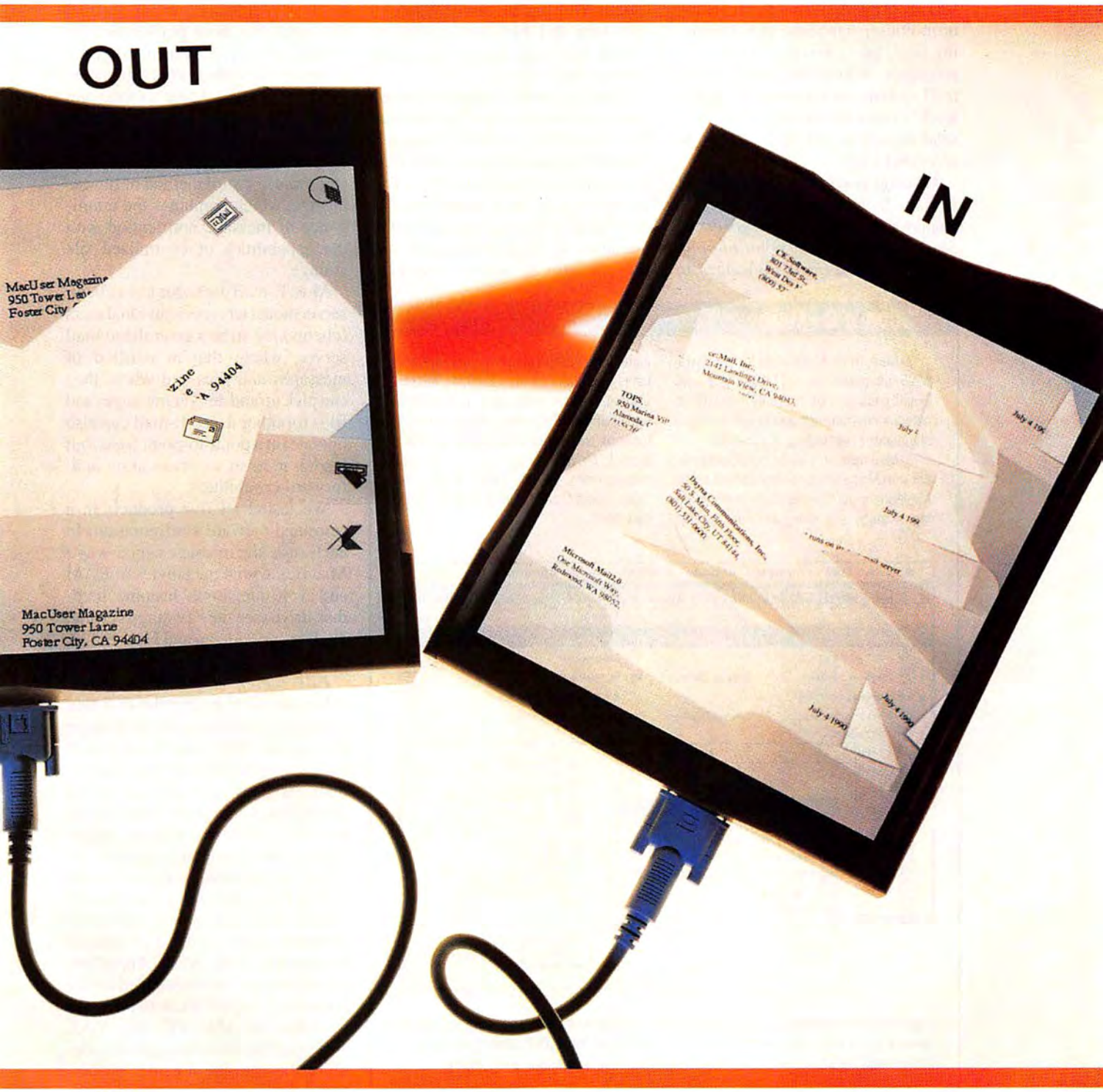
Electronic mail on the Mac is only five years old — a fairly long life, considering that the Mac itself just celebrated its sixth birthday. But it's been an active five years for E-mail, as this messaging and file-sharing office necessity has come to be known. Features and performance have improved while different delivery strategies fight for market dominance. And developers aren't standing still. Hosts of new features are promised for future releases: electronic report distribution, archival services, computer conferencing, and forms-routing systems, to name a few.

Whether or not these future features materialize, E-mail users will always be concerned with one central issue — getting the mail through fast. MacUser NetWorkShop dissected five major Mac E-mail products to test how well they responded to this eternal need. We asked two basic questions: How do E-mail products work? and how does their structure affect performance?

We tested cc:Mail from cc:Mail, Inc.; DaynaMAIL from Dayna Communications; InBox Plus from TOPS (WorkStation InBox, for 20 users, comes bundled with TOPS; InBox Plus, for 100 users per server, is sold separately); Microsoft Mail from Microsoft; and QuickMail from CE Software. A sixth major E-mail program, 3Com's 3+Mail, was not tested, because it is a fully integrated component of a suite of network-management applications and is not sold as a stand-alone E-mail product (see the "3Com's 3+Mail" sidebar).



PHOTOGRAPHY FRED STIMSON


OUT
IN
MacUser Magazine
950 Tower Lane
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Delivering the Mail

When you set up a LAN (local-area network) in your office, you enable work-group activities such as sharing printers and modems; setting up multiuser databases; and exchanging files, using servers and transfer programs. When you install an E-mail system, you increase your network's value by permitting a user to send messages and files directly to any other user.

Messaging and storage. There are two fundamental strategies for exchanging messages and files between Macs on a network: *point-to-point* and *store-and-forward* exchanges. In a point-to-point strategy, one node sends a file — or message — directly to another node. Store-and-forward systems use a central repository, usually a file or mail server, where all messages and files are stored and sent on to their destinations as needed or requested.

Point-to-point file *transfer* doesn't have centralized store-and-forward file *sharing's* one major advantage: the ability to retrieve stored files from the central server at a later time. This is important in cases where users are continuously logging on to and off of the network, because messages and files can still be sent to them even when they are not on-line.

Simple file-transfer strategies — both point-to-point and store-and-forward — are considered "blind," because recipients are not notified that a file has been placed on their Macintosh's drive. This intelligence is now being added to both methods. Products such as Apple's Oscar and Beagle Bros' Flash have added notification to point-to-point transfers. E-mail systems use a sophisticated store-and-forward method of file exchange, which combines the intelligence of message notification with the capabilities of centralized file storage.

Most E-mail packages use a client/server model wherein individual users (clients) log in to a centralized mail server, where they're notified of messages and files and where they can pick up and deliver messages and files for other users. E-mail can also operate on a point-to-point basis, but having it do so sacrifices store-and-forward capabilities.

We tested all five products in a store-and-forward configuration. In each case, the message center was a Mac IIcx with 4 megabytes of RAM and a 40-megabyte Jasmine hard-disk drive (see the "Testing, Testing, Testing..." sidebar and Figures 1, 2, and 3).

File server versus mail server. When we were testing the five programs' performance, the first major differences showed up in relation to their server configurations. Some E-mail packages, such as cc:Mail and DaynaMAIL, must be installed on top of a file server, such as AppleShare; other programs operate by using their own mail-server software.

The file-server setup has the advantage of letting you pick your server platform more easily. File servers compatible with AFP (AppleTalk Filing Protocol, recommended for file servers on AppleTalk networks) are available for Mac, PC, and VAX systems. The disadvantages of a file-server-based system center on performance: In order to preserve the

3Com's 3+Mail

3+Mail, from 3Com (one to five users, $595; unlimited users, $1,190), is a solid E-mail package that runs only in the 3Com network environment and is not sold as a stand-alone messaging application.

3+Mail runs on a variety of 3Com servers with Mac and PC clients, as well as the AppleShare-compatible 3+Open networking strategy. Its many features include icons for message status, a filter for name listing, local (personal) name lists, aliases, groups, multiple enclosures, and notification of undeliverable mail. Users can reply, forward, and register messages for return receipt, as well as set options for mail management. 3Com Corp., 3165 Kifer Road, Santa Clara, CA 95052-8145; (408) 562-6400.

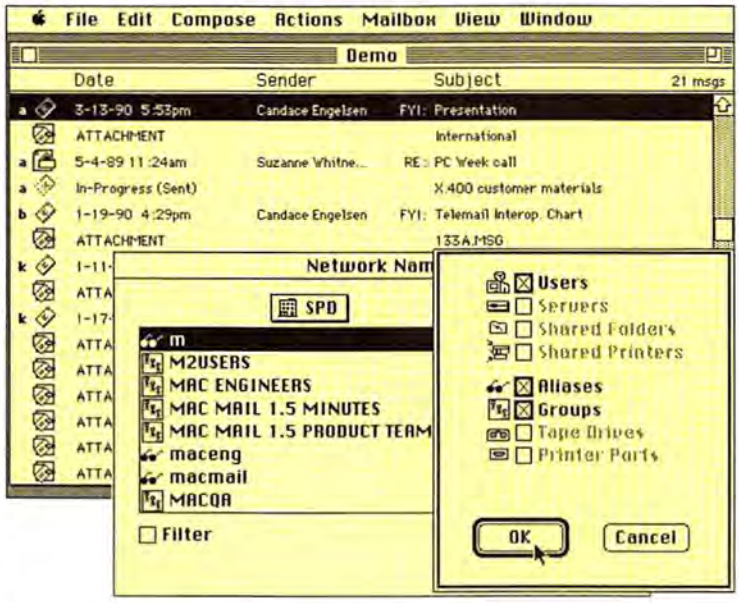


Figure A: This composite 3+Mail screen shot shows incoming mail, with unread and opened icons and attachment folders. Overlaid is the Network Names Viewing Option box, which lets users select and deselect users, aliases, and groups.

server's interoperability among platforms, these E-mail systems sometimes require the client to execute operations that in other programs would be performed by the server. DaynaMAIL, for example, replicates a file when sending the same message to several people, whereas cc:Mail opens *user-index files* from across the network to notify the recipients that a message has been posted. Either operation can tie up a user's Mac for considerable amounts of time as well as increase network traffic.

DaynaMAIL and cc:Mail require a file server as a base. When testing these two products, we first installed AppleShare on the Macintosh IIcx servers and on the clients' SEs. Only then could we install the server and client software for DaynaMAIL and cc:Mail. Both of these programs were generally slower than the three mail-server-based systems. InBox, however, was slower than QuickMail and Microsoft Mail, since TOPS chose to make the InBox client do more work than QuickMail's or Microsoft Mail's clients do.

File copying versus databases. A crucial aspect of an E-mail program's performance is its structure, or the

Figure 1: Single-Message Performance

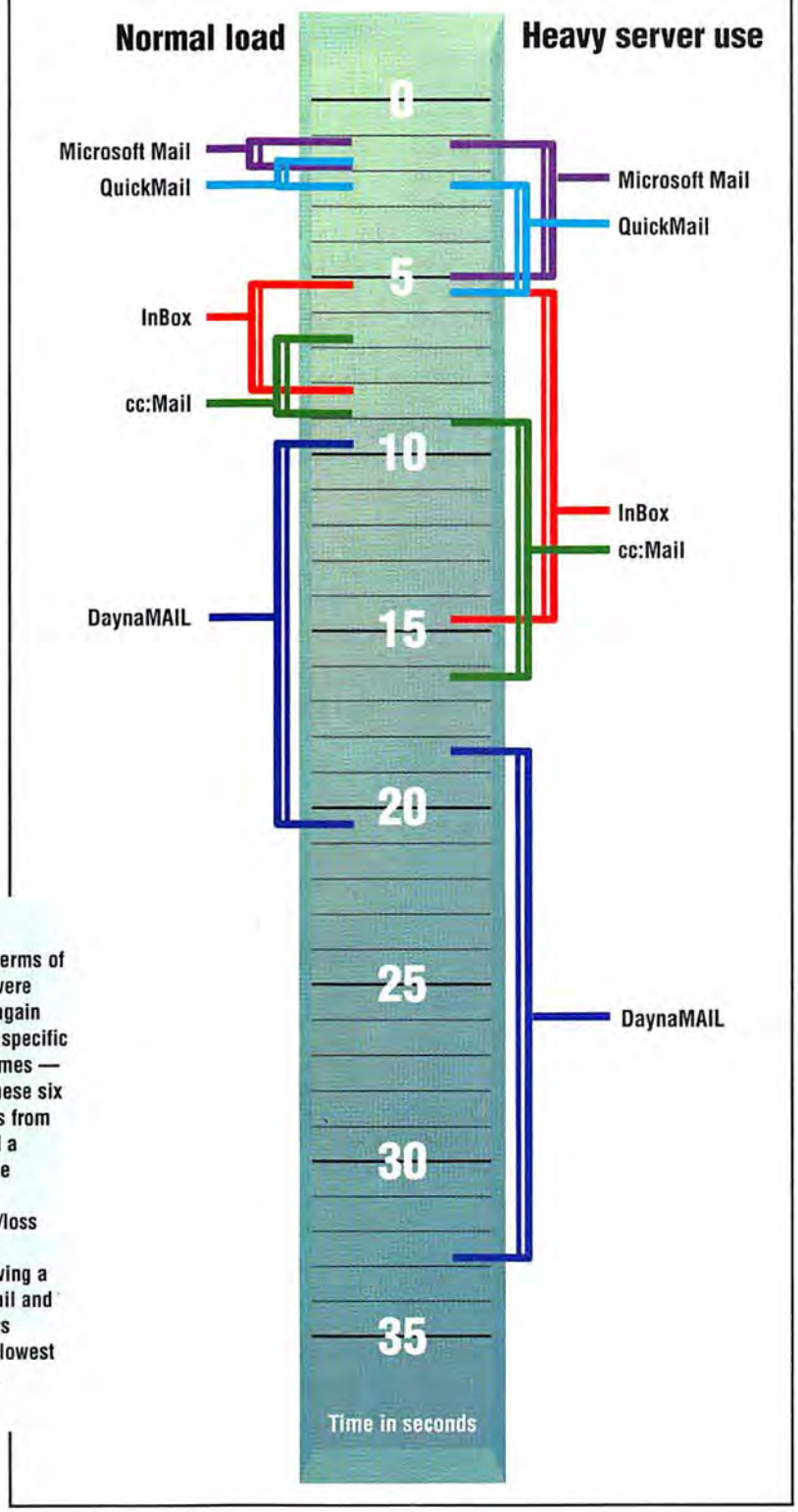


Figure 1: E-mail performance is measured in terms of two factors: speed and consistency. All tests were done once in normal network traffic and then again with 30 other messages flooding the server at specific intervals. We tested each E-mail system six times — each bar shows the range of performance of these six tests. Inconsistent performance prevents users from being sure of how fast a mail system will send a message under varying conditions — a definite drawback, as uncertainty leads to frustration.

The single-message test sets the basic win/loss pattern: The front-runners are QuickMail and Microsoft Mail, with Microsoft's program showing a little more speed. The next tier includes cc:Mail and InBox, with InBox showing faster times but less consistent performance. DaynaMAIL has the slowest times and the most inconsistent performance.

way messages and files are sent and stored in the E-mail server. Some E-mail programs send, copy, and store messages and files as separate items in several folders — one for each client. Others store messages and files as a single item inside a database (see the "How It Works" sidebar). In the first case, data insurance is bought at the cost of greater server activity and disk fragmentation. In the second, data efficiency is bought at the cost of putting all the eggs in one basket.

Our tests show a direct correlation between client/server structure and performance. Structure has a direct bearing on how users perceive an E-mail system's performance — some packages, such as DaynaMAIL, InBox, and — to a certain extent — cc:Mail, make users wait while they deliver messages addressed to several users. Administrators, on the other hand, don't look too kindly on a package, such as QuickMail, that can overtax a server's hard-disk drive by rapidly filling it with messages and files.

Each structure does have its advantages, however. Mail programs that replicate files (DaynaMAIL, InBox, and QuickMail) ensure that all users sent a message get their own copy. The programs that keep a single copy in a database (cc:Mail and Microsoft Mail) ensure efficiency by storing 1 copy of a message — rather than 5, 10, or 30 — thus minimizing disk usage.

Setup and Administration

Setting up a fast and reliable E-mail system requires good planning. You can enhance performance by using a fast CPU with at least 2 megabytes of RAM and a fast hard-disk drive as the server. Also, use zoning strategies that don't put too

Testing, Testing, Testing . . .

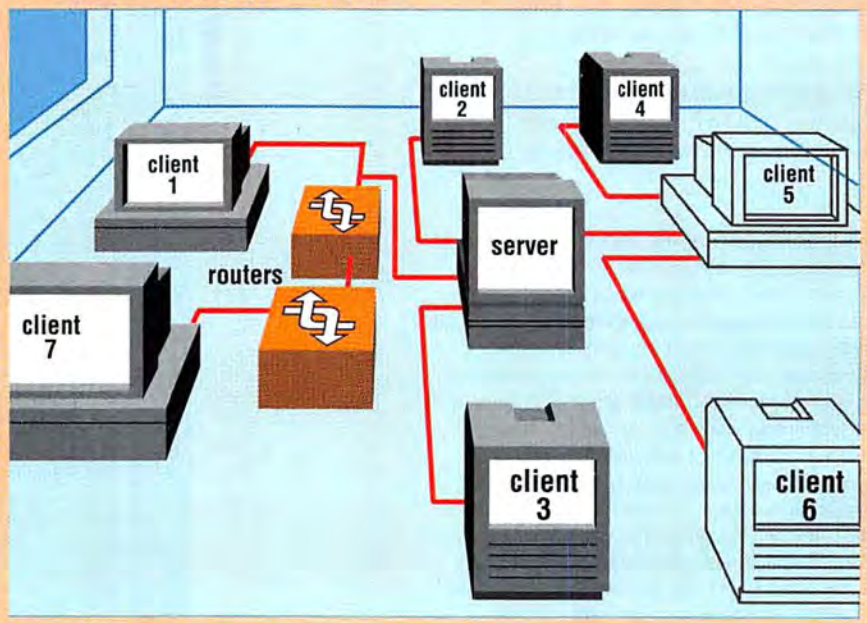
When we began this comprehensive review of E-mail systems, we had two choices concerning how to proceed. We could send all of *MacUser*'s editors, writers, designers, and sales staff on vacation and use the magazine's 100-Mac network for a month's testing. Or we could set up camp in the MacUser NetWorkShop and thrash our test network until an E-mail winner emerged. We chose the latter course.

MacUser NetWorkShop first installed each E-mail system as recommended by the manufacturer. We then created a variety of automated procedures to test each system under three simulated workloads: (1) a "normal" load, defined as 30 users per server, each sending four messages per hour, including one message with an enclosed 20-kilobyte file; (2) an added AppleShare overhead, created by transferring a 10-megabyte folder to the mail server during message activity; and (3) a busy background network condition, created by one user continuously sending a message with an enclosed 20-kilobyte file to 30 users.

We ran these tests 11 times. Each test examined a different aspect of E-mail performance. Since network variables can affect message-transfer speed, we repeated each test 6 times to ensure that we discovered each system's full performance range. We repeated some tests over two routers to simulate internet transfers.

We've boiled the results down to three sets that best tell the story: single-message (Figure 1), enclosed-file (Figure 2), and multiple-message performance (Figure 3). The complete set of test results, including precise timings for each iteration, will soon be available on *MacUser*'s new on-line service, Zmac (see "On the Line with *MacUser*" in this issue).

MacUser NetWorkShop created a mininetwork of a server, clients, and routers to test E-mail-system performance.



Client 1 initiated all test messages.

Clients 2 and 3 simulated a normal level of mail use.

Client 4 flooded the server with messages to 30 different addresses to simulate a busy system.

Clients 5 and 6 were "virtual Macs," simply addresses on the server rather than actual machines.

Client 7 tested performance over routers.

many devices in one zone or too many users on one E-mail server (see "How to Set Up the Perfect Network" June '90, page 142). Avoid having users access servers over routers — routers can degrade performance and make users lose connection with their mail center.

If you use AppleShare as your file server for DaynaMAIL or cc:Mail, consider whether the file server should be active at the same time as the E-mail system. All the E-mail packages reviewed here are compatible with AppleShare, giving you the economical option of running both servers on the same Mac. The more traffic there is on either of the servers, however, the poorer the performance of both. To avoid this situation, many companies recommend that you dedicate a Mac to mail serving alone.

Setup and user lists. DaynaMAIL and cc:Mail are the least friendly to use when you're setting up the E-mail system and establishing user lists, in part because they reside on a file server. Users can't use the E-mail service unless the server volume is mounted and their names are registered on the file server; they must also be registered with the E-mail server.

InBox, QuickMail, and Microsoft Mail are easier to set up. Their manuals provide comprehensive information on setting up your network, and

Figure 2: Enclosed-File Performance

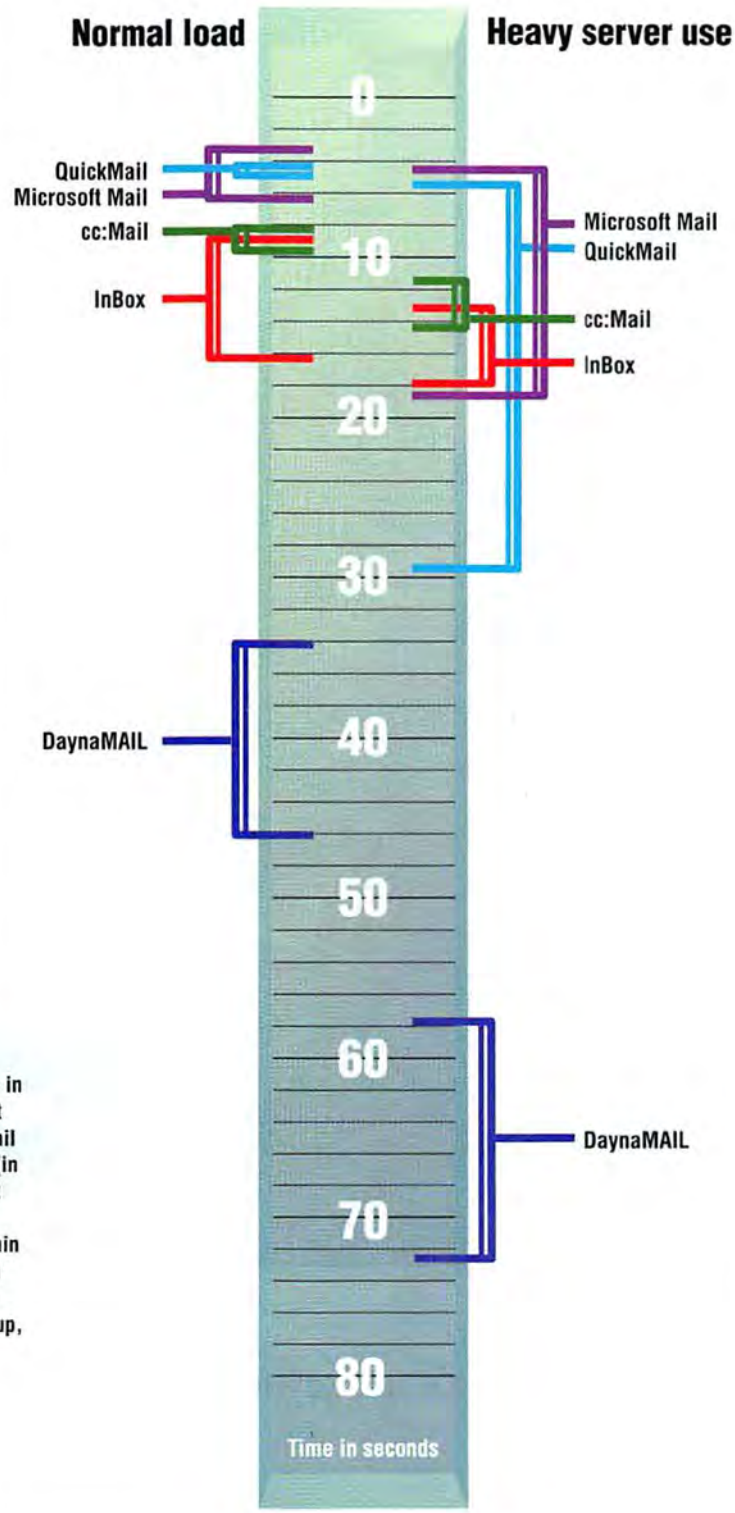


Figure 2: This test shows some interesting changes in the E-mail map. DaynaMAIL is still the slowest, but InBox and cc:Mail have changed places, with cc:Mail edging out InBox both in speed and in consistency (in most of the other tests, not shown, InBox edges out cc:Mail).

Under normal conditions, our front-runners remain Microsoft Mail and QuickMail. Although it turned in the fastest times, Microsoft Mail is less consistent than QuickMail. When the load on the server goes up, however, the leaders falter, and both cc:Mail and InBox show more consistent — and faster — performance.



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Please circle 46 on reader service card.

Table 1: Features of E-Mail Systems

	cc:Mail 1.1	DaynaMAIL 1.01	InBox Plus 3.0	Microsoft Mail 2.0	QuickMail 2.2.2
Mouse rating	↕↕↕	↕↕½	↕↕↕½	↕↕↕↕	↕↕↕↕
List price	25 users, $495 next 75 users, $595 next 100 users, $595 cc:Mail for DOS, $695	5 users, $295	100 users, $995	server, $395 1 – 4 users, $125 20-Pak, $1,495 PC Workstation, $125	1 user, $189.95 5 users, $339.95 10 users, $499.95 50 users, $2,299.95
Multiple-copy handling					
Messages	single copy	each addressee	each addressee	single copy	each addressee
Enclosures	single copy	each addressee	single copy	each addressee	each addressee
Maximum users per server	65,000	unlimited	100	unlimited	3,200
Number of enclosable files	20	1	unlimited	1	16
Server platforms					
Mac	●	●	●	●	●
PC/XT	●	●	●	○	○
VAX	●	○	●	●	○
Others	●	○	●	○	○
Client PC option	●	○	●	●	●
Messages are stored in					
Database	●	●*	○	●	○
Files	○	●*	●	○	●
User features					
Configurable address groups	●	●	●	○	●
Keyboard addressing	●	○	○	●	●
Customizable forms	○	○	○	●	●
Voice message	○	○	○	●	●
Real-time conferencing	○	○	○	○	●
Remote dial-up utility	●	●	○	●	●
Message sorting					
By priority	○	○	●	○	●
By subject	○	●	●	○	●
By sender	○	●	●	○	●
By date	●	●	●	●	●
Search message for string	○	○	●	○	○
Mail log	●	○	○	○	●
Unsend message	○	○	○	○	●
On-line help	○	●	●	●	●
Administrator features					
View passwords	○	●	●	○	○
Read user messages	○	●	○	○	○
Server data compression	●	○	○	●	○
Backup-and-restore utility	●	○	○	●	○
Update name directory					
Manual	●	●	●	NA	●
Automatic	○	○	○	●	●
Return undeliverable mail	●	○	●	●	●
Other					
Warranty period	90 days	90 days	6 months	90 days	90 days
Manufacturer	cc:Mail, Inc. 2141 Landings Drive Mountain View, CA 94043 (415) 961-8800	Dayna Communications 50 S. Main, Suite 530 Salt Lake City, UT 84144 (801) 531-0600	Sun Microsystems, Inc. TOPS Division 950 Marina Village Parkway Alameda, CA 94501 (415) 769-9669	Microsoft Corp. One Microsoft Way Redmond, WA 98052 (206) 882-8080	CE Software 1854 Fuller Road P.O. Box 65580 West Des Moines, IA 50265 (800) 523-7638 (515) 224-1995

*Messages can be saved either as files or in a database — not both.

InBox and QuickMail provide detailed specifications on the RAM and disk space you'll need, depending on use. Microsoft Mail is the most streamlined of the three, and its setup is the easiest.

The first administrative task to tackle when setting up a mail program is building the user-name lists and assigning passwords. DaynaMAIL gets low marks here because you need to remember precisely how you entered users' names in the AppleShare list — it doesn't recognize any spelling variations. DaynaMAIL also confines you to the DOS eight-character naming convention, which means a long name can't be entered in full. InBox is more generous and also allows you to configure the user-name list by first or last name or put it in a customized order.

The administrator needs to be able to maintain these lists easily, especially if the mail server is on an internet (where two or more networks are linked via a bridge or router). In such cases, propagating directories for various servers so that users know whom they can send messages to can be difficult. The key thing to know

Figure 3: Multiple-Message Performance

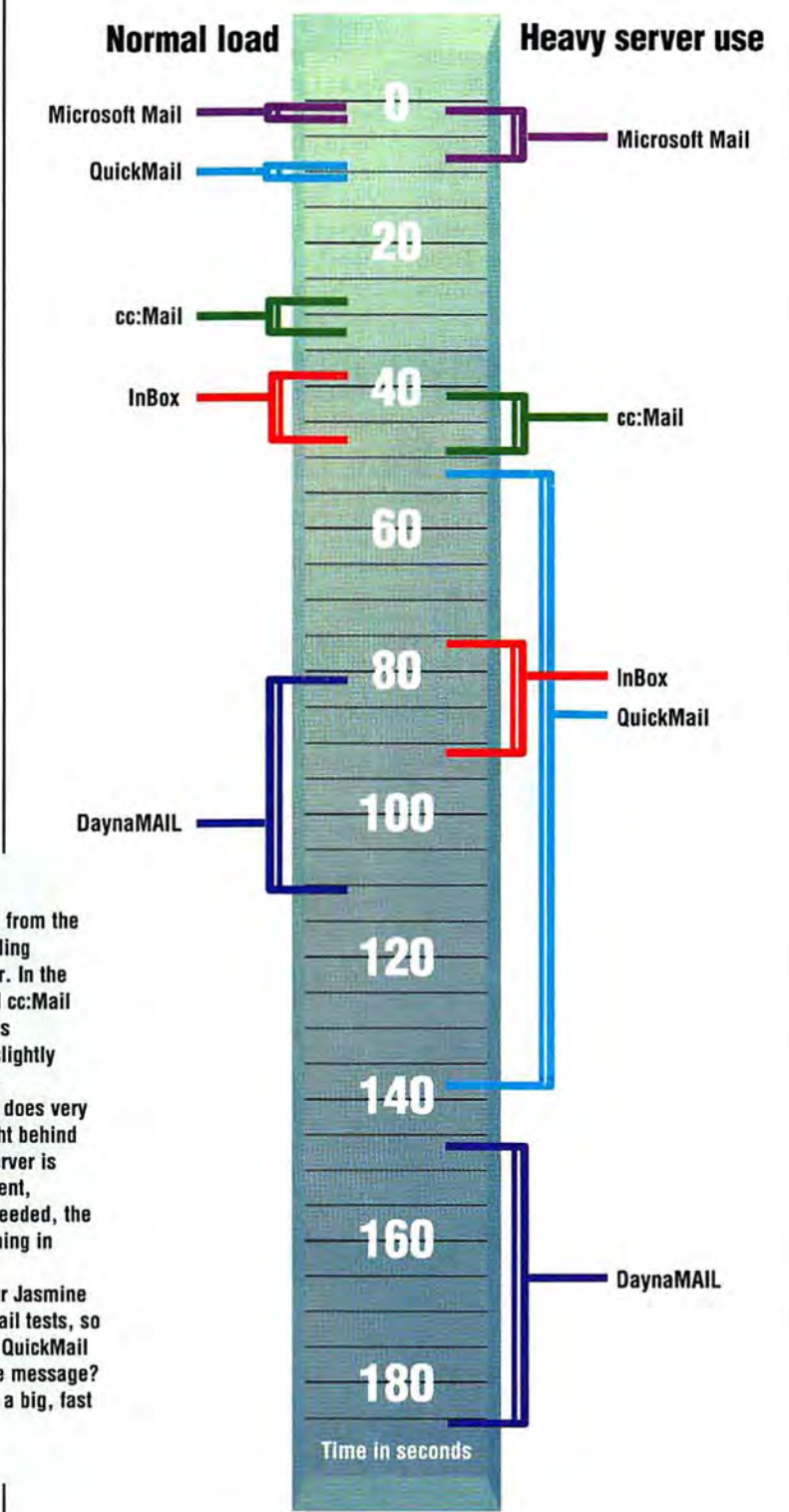


Figure 3: Here's the test that separates the mail from the snails. DaynaMAIL's inefficient method of handling multiple messages causes it to bring up the rear. In the second tier, we see InBox dropping back behind cc:Mail under normal conditions. Interestingly, cc:Mail's performance when the server is busy falls just slightly behind InBox's performance under normal load.

Then comes the most telling race. QuickMail does very well in the tests under normal conditions — right behind the true speedster, Microsoft Mail. When the server is being besieged with messages from another client, however, QuickMail chokes. As the testing proceeded, the degradation increased, until QuickMail was turning in almost DaynaMAIL-like times.

Two other important factors aren't shown: Our Jasmine 40 ran out of space halfway through the QuickMail tests, so we had to stop and clear out the drive. Second, QuickMail causes a high degree of disk fragmentation. The message? If you choose QuickMail, equip your server with a big, fast hard-disk drive.

about any mail package is whether separate lists are maintained for each server or a global directory is built and maintained at every server.

DaynaMAIL and cc:MAIL maintain separate lists for each server, which have to be manually updated one at a time when users change. cc:Mail lets you import and export lists from server to server to maintain current directories across internets. PO Manager (from the River Bend Group in McLean, Virginia) automates this for you.

QuickMail maintains separate user lists for each server. Users can see other local servers by accessing those zones and manually adding names from another zone's directory to their own. QuickMail also has a NameServer utility, which is installed on the mail server and maintains a database of all internet E-mail recipients. You still have to manually export and import lists across servers to build global, enterprisewide directories, but the NameServer lets you do a certain amount of administrative work by allowing you to keep your personal group lists current.

InBox Plus and Microsoft Mail provide automatic directory propagation across servers whenever a change in any server's name directory is registered. Building a global list of names at each server has the advantage of keeping list administration to a minimum and screening out the internet's complexities to users, who see one list of names and don't have to worry whether the recipients of their mail are located in the next room, the next

Report Cards

cc:Mail 1.1

★★★

One of the foremost PC mail systems, cc:Mail is now available in a Mac incarnation. It's a solid, if unexciting, product. It uses an efficient database structure that stores multiple-addressee files and enclosures just once, and its server can run on several different platforms. Clients can include Macs and PCs (running DOS or OS/2). Features include bulletin boards,



A PC favorite, cc:Mail 1.1 is a new entry in the Mac market.

groups, keyboard loading of recipient names, message prioritizing, multiple enclosures, return receipts, reply and forwarding, storage folders, and archiving. In our performance tests, however, cc:Mail placed fourth.

Pros: Good interface. PC-to-Mac VGA-graphics-display translation. Up to 20 file enclosures.

Cons: Requires PC for setup, administration, and server-to-server traffic. File server required, and user must mount file-server volume to access mail. No DA for messaging. Slow in sending messages to multiple recipients.

List Price: 25 users, $495; next 75 users, $595; next 100 users, $595; cc:Mail for DOS, $695.

cc:Mail, Inc., 2141 Landings Drive, Mountain View, CA 94043; (415) 961-8800.

DaynaMAIL 1.01

★★½

DaynaMAIL from Dayna Communications is a basic E-mail package that can be installed in either a server- or node-based mode. In server mode, the mail server runs on top of any AppleTalk-compatible file server on a Mac or PC. Node installation can sit on top of TOPS. DaynaMAIL uses an inefficient multiple-copy store-and-forward method for both mail and enclosures. Basic memo and phone-message forms are included, but only a single file can be enclosed with each message. Messages can be sorted by topic, date, or person addressed. Mail compression and decompression contribute to DaynaMAIL's poor performance; it finished last in our tests.

Pros: Good mail management.

Cons: Buggy. Tricky to install and maintain. Serialized workstations. DOS naming conventions. User must mount AppleShare volume to use DaynaMAIL.

List Price: Five-pack, $295.

Dayna Communications, Inc., 50 S. Main, Fifth Floor, Salt Lake City, UT 84144; (801) 531-0600.



DaynaMAIL 1.01 has some good features, but it needs more work.



InBox Plus 3.0 is cost-effective and a good performer.

InBox Plus 3.0

★★★½

InBox from TOPS is an above-average E-mail package that runs on its own mail server or on top of AppleShare or TOPS. Servers can include Macs, PCs, Sun workstations, VAXes, and other platforms. Both Macs and PCs can be clients. Workstation InBox allows 20 users per server and is bundled free with TOPS. InBox Plus allows 100 users, plus server-to-server communications. Messages are duplicated for each addressee, but enclosed files are stored only once (saving both time and space). Message forms include only Memo and Phone; it supports mailboxes, groups, user-configurable passwords, and storage boxes. Messages can be sorted by subject, sender, status, and date, or selected by character string. InBox finished third in our performance tests.

Pros: Easy setup and excellent manuals. Unlimited file enclosure. Remembers window positions.

Cons: Multiple-addressee sends go out from user. No custom forms. No keyboard loading of recipient names.

List Price: 100 users, $995.

TOPS, 950 Marina Village Parkway, Alameda, CA 94501; (415) 769-9669.

Microsoft Mail 2.0

★★★★

Microsoft Mail offers a mix of functions with Mac and VAX servers, over local-area networks and larger internets. An efficient single-instance storage scheme is used for messages and enclosures to multiple addressees. User directories are automatically propagated. The mail server automatically reclaims disk space when messages are deleted. Features include keyboard name entry for messages, customizable forms, image display and voice-mail support, and interapplication communication with Excel and Word. Microsoft Mail edged out Quick-



Microsoft Mail 2.0 is a close second to QuickMail.

Mail in most of our performance tests.

Pros: Clean interface. Simple to install, maintain, and use. Automatic propagation of user directories. Quick keyboard loading of recipients. Efficient database server. Customizable forms.

Cons: No multiple-file enclosures. No local folder storage. No searching or sorting of messages.

List Price: Mail Server, $395; 1 to 4 users, $125; 20-Pak, $1,495; PC Workstation, $125.

Microsoft Corp., One Microsoft Way, Redmond, WA 98052; (206) 882-8080.

building, or even Hong Kong.

Server/client maintenance. Maintenance includes adding users to the system, adding new features as they become available, backing up the mail files, and optimizing the server disk for better performance.

Optimizing the server disk deletes empty spaces between files and between parts of files that can slow down disk read time. This process becomes more and more critical over time for products that replicate messages, such as DaynaMAIL, InBox, and QuickMail. Microsoft Mail and cc:Mail, which use single-instance storage systems, do not show nearly as much disk fragmentation.

DaynaMAIL, InBox, and QuickMail showed considerable server-disk fragmentation after our tests. Fragmentation also occurs when files are deleted. DaynaMAIL and QuickMail, however, reclaim some of this disk space by cleaning up user folders whenever a user logs off. Our tests showed this to be a lengthy process with DaynaMAIL.

InBox Administrator has a utility for reclaiming disk space when the server is not in use — late at night, for instance — since deleting messages from the server deletes only their directories and not the actual files.

Considering the importance of backing up and restoring for data security and performance, it's surprising that none of the manuals spends much time on the subject and that only Microsoft Mail provides a backup-and-restore utility.



The superior features of QuickMail 2.2.2 make it our first choice.

QuickMail 2.2.2
★★★★

QuickMail from CE Software takes first place in the features contest and finished a close second to Microsoft Mail 2.0 in our speed trials. Macs and PCs can be used as clients. An inefficient multiple-addressee scheme that replicates messages and enclosures on the server hits performance hard in a busy environment. Messages can be sorted by priority, subject, recipient, or date; folders can be created for local storage. Sixteen files can be enclosed per message. Each user can establish a personal Mail Log to keep track of messages and can unsend and unread messages. Users can customize forms. Voice-mail is supported, as is real-time conferencing.

Pros: Powerful user tools, highly configurable. Multiple file enclosures. Customizable forms.

Cons: Busy interface. Disk-hungry server. Extensive disk fragmentation with heavy use. Minor bugs.

List Price: 1 user, $189.95; 5 users, $339.95; 10 users, $499.95; 50 users, $2,299.95.

CE Software, 1854 Fuller Road, P.O. Box 65580, West Des Moines, IA 50265; (800) 523-7638.

User Features

E-mail should be easy to use, with a minimal set of straightforward user functions and a clean user interface (see Table 1). It should make addressing and sending a message or enclosing a file simple, and there should be keyboard equivalents for most mouse and menu operations.

All of the programs except cc:Mail use a DA for listing a user's mail, and all of them let you print a message, but there the similarities stop. QuickMail has the greatest number and variety of user features, although sometimes at the cost of a cluttered interface (see Figure 4). At the opposite end of the feature spectrum is Microsoft Mail, which has a streamlined look that users take to easily (see Figure 5). In between are the other three packages, which take their own approaches to user-interface design (see Figure 6).

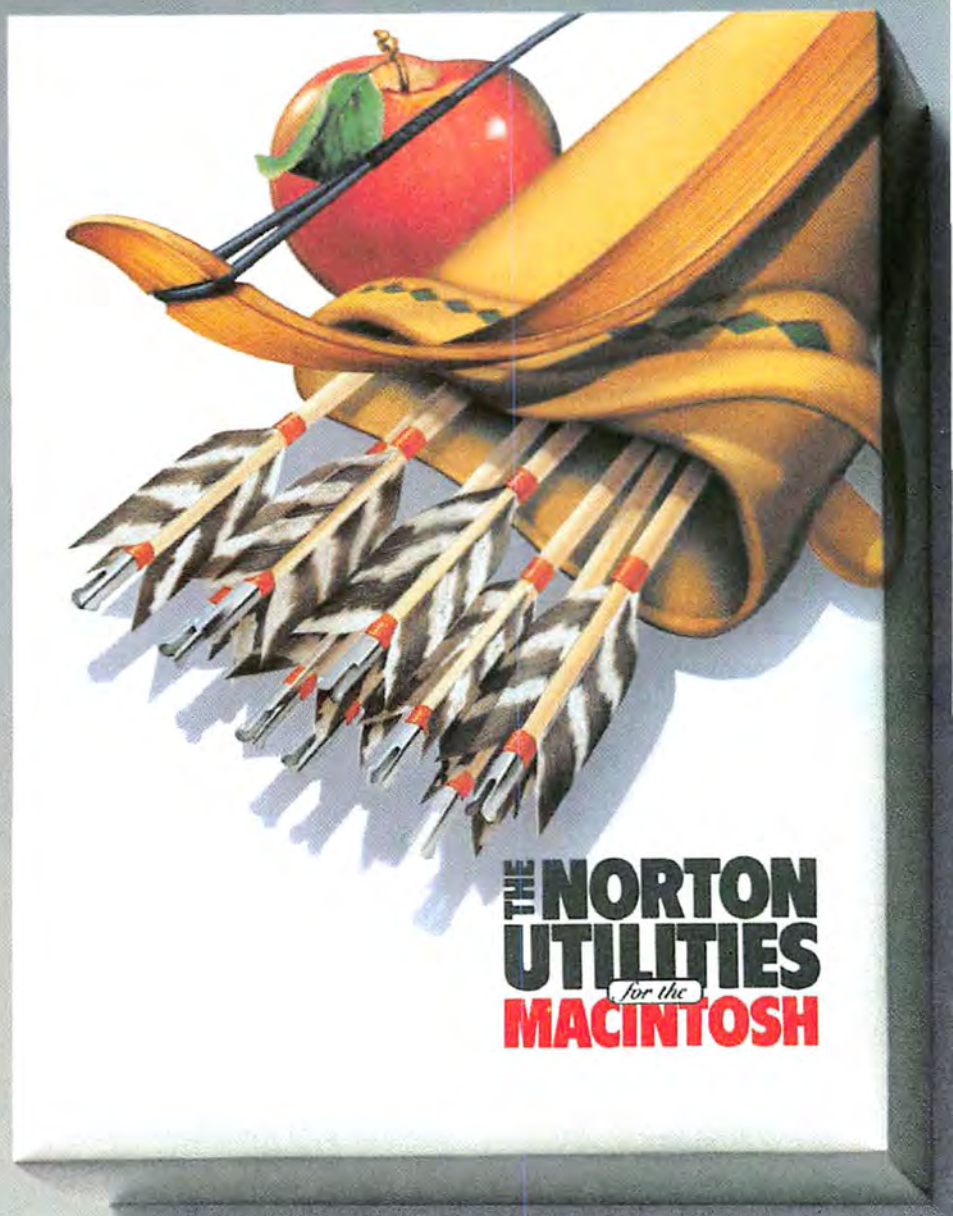
User preferences. These settings allow users to decide several details, such as how often and by what method they are notified of incoming mail. DaynaMAIL and cc:Mail provide the fewest options, QuickMail the most.

QuickMail lets you sort your mail by priority, subject, sender, and date (version 2.2 adds a reverse-sort feature). You can do most of this in DaynaMAIL and InBox too, with DaynaMAIL categorizing your messages as new or old mail for viewing. InBox has a search function that lets you screen out mail from your list.

Most of the products we looked at send you a receipt when your mail has been read. But because it's easy to forget a memo when it's out of sight, this feature is of only limited use. QuickMail is the only product that has a User Mail Log (there's an Administrator Mail Log in cc:Mail). QuickMail's log tracks every piece of mail that a user has sent, whether it's Pending (for another server), Unread, or Read. You can also retrieve and "unsend" messages. This utility entails a certain amount of server overhead, however, because a file is maintained on the server until you delete it in the log.

Multiple addressees and groups. To select message recipients in InBox and DaynaMAIL, the user must manually scroll through a name list, which quickly becomes tedious if the list is long. Users should be able to locate a potential addressee by typing the first couple of characters in the name and pressing Return. cc:Mail, QuickMail, and Microsoft Mail all let you address your mail from the keyboard, and you can designate a recipient as CC: (carbon copy) or BCC: (blind carbon copy, unseen by the other recipients). In QuickMail, you keep pressing Return to rotate recipient names through these designations.

Sending messages to multiple recipients can be a chore. One way to avoid having to select each name is to create a group. If you typically send a message to everyone in accounting, for instance, you can create an accountants' group and then simply address your message with the group name when you want to send it to



If that sounds like an outrageous statement, it sure is.

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To see what we mean, see what happens when you call up our revolutionary *Norton Disk Doctor.*®

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All by itself.

In fact, the Disk Doctor automatically diagnoses and repairs the 45 most common—and dangerous—problems your disk can confront you with.

Including a whole bunch of things the other guys can't even detect, let alone repair.

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Like the rest of the tools in this box, UnErase has been designed expressly for the Mac, to recover more kinds of trashed files, more quickly and with less effort on your part than any other program.

Instead of just one level of data recovery, we give you three.

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By Text Search. Or use *Quick UnErase* to scan your fully loaded hard drive in as little as five seconds.

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Whether your drive is fully loaded or nearly empty, *Speed Disk*™ is—here we go again—the quickest, easiest and safest way to dramatically accelerate disk access.

And unlike other programs, Speed Disk won't lose your data even if your Mac loses power.

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And when it comes to unformatting your hard disk, nothing compares with our *Format Recover* and *FileSaver.*



Together they not only let you resurrect 100% of your data, they do it in a tiny fraction of the time it takes other programs.

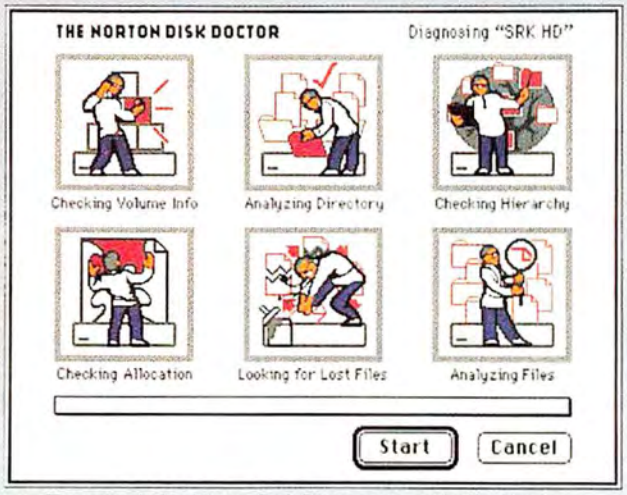
What a find.

Of course, you don't have to lose your data to want to get at it as quickly as possible.

That's something you want to do every day, every time you open a file.

So you'll be interested to know that *Fast Find* locates and opens files so quickly, you may never use the Mac's standard Find File desk accessory again.

But you'll use our accessories and control panel devices daily.



The remarkable Norton Disk Doctor automatically diagnoses, reports and repairs the 45 most common—and dangerous—disk problems. It even tells you when it's time to run our Speed Disk utility and optimize your Mac's performance.

If all of this looks too good to be true, see your favorite software dealer for a demonstration.

If you haven't got a favorite software dealer, call us right away at **1-800-365-1010 Ext. 423.**

We'll send you more information.

Peter Norton COMPUTING

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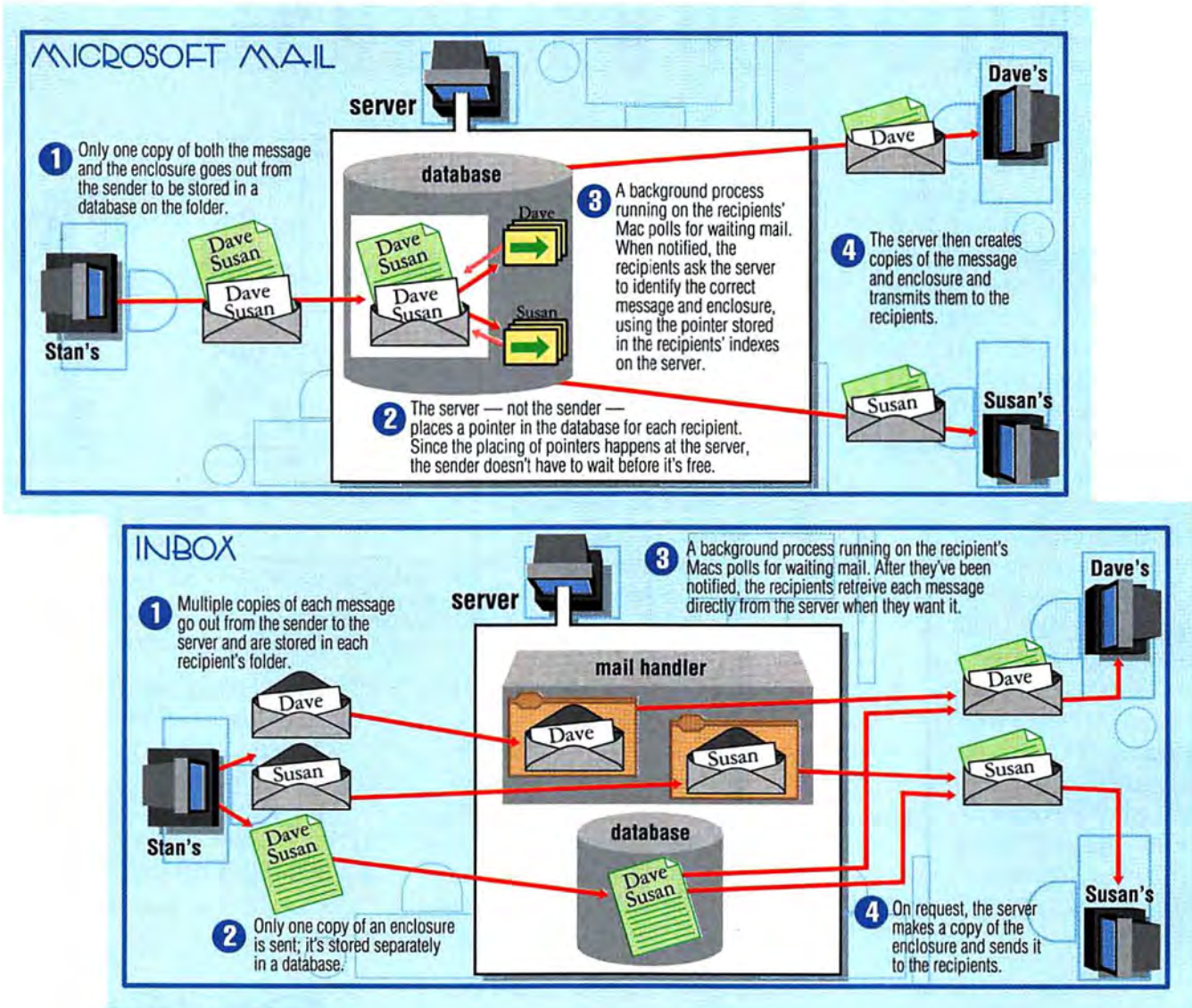
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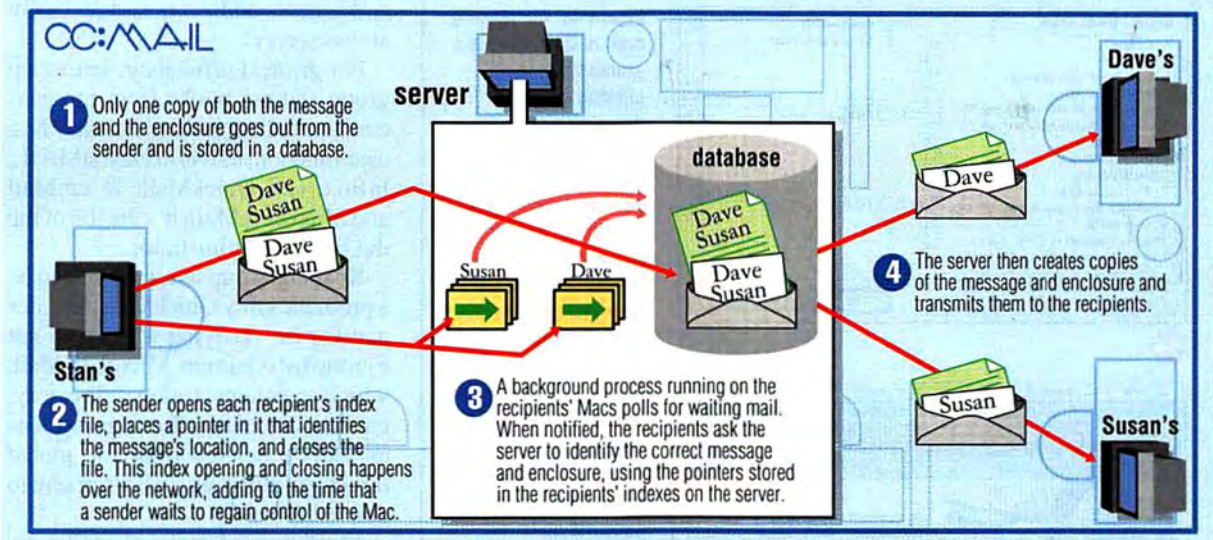
How It Works: Multiple-Message Handling

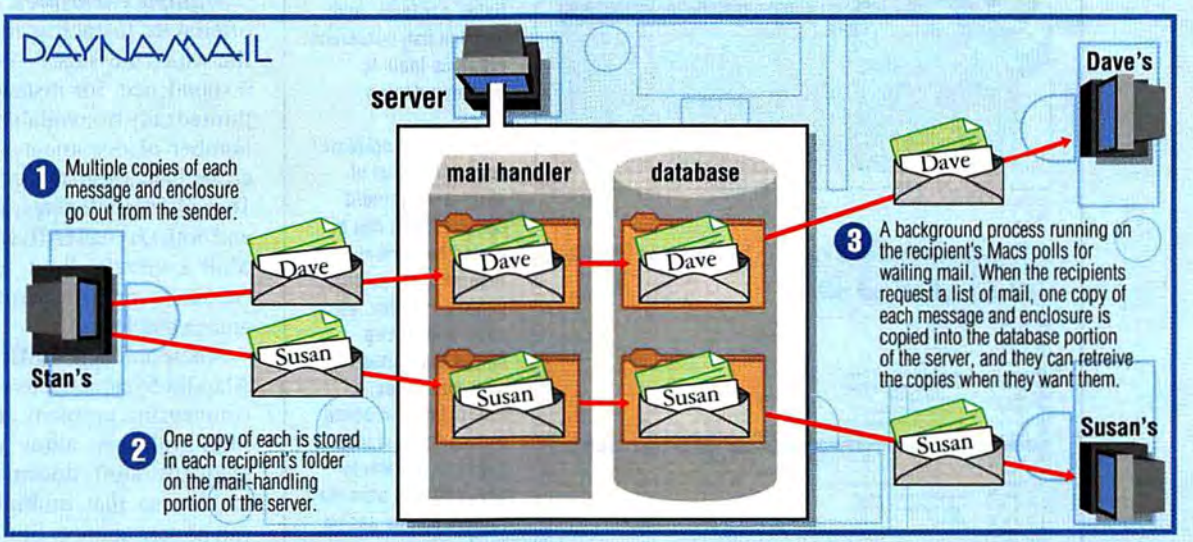
Two important factors affect E-mail performance: Which Mac does more of the message-handling chores — the sender or the server? How is a message for multiple recipients stored on the server — as multiple files or as multiple pointers (location indicators) to a single entry in a database? Each of the five E-mail systems we examined has a different approach to handling multiple messages.

When the server does the bulk of the message handling — delivering and copying files — the sender is free to carry out other duties. When the sender must take care of message processing, the user is forced to wait — and when multiple-message-handling strategies are inefficient, the wait can be an extremely long one.

The most efficient multiple-message strategy is faster and requires less storage space on the server. It stores one copy of a message and any enclosed file on the server as a single entry in a database. A less efficient approach stores a copy of a message and enclosure in each recipient's server folder. This second multiple-copy strategy offers some increase in reliability, since there's more chance of at least partial recovery if the server goes down. Although databases put all their eggs in one basket, you can count on good databases to be both efficient and reliable.




CC:MAIL
server
database
Dave's
Susan's
Stan's
1 Only one copy of both the message and the enclosure goes out from the sender and is stored in a database.
2 The sender opens each recipient's index file, places a pointer in it that identifies the message's location, and closes the file. This index opening and closing happens over the network, adding to the time that a sender waits to regain control of the Mac.
3 A background process running on the recipients' Macs polls for waiting mail. When notified, the recipients ask the server to identify the correct message and enclosure, using the pointers stored in the recipients' indexes on the server.
4 The server then creates copies of the message and enclosure and transmits them to the recipients.
Dave
Susan


DAYNAMAIL
server
mail handler
database
Dave's
Susan's
Stan's
1 Multiple copies of each message and enclosure go out from the sender.
2 One copy of each is stored in each recipient's folder on the mail-handling portion of the server.
3 A background process running on the recipient's Macs polls for waiting mail. When the recipients request a list of mail, one copy of each message and enclosure is copied into the database portion of the server, and they can retreive the copies when they want them.
Dave
Susan

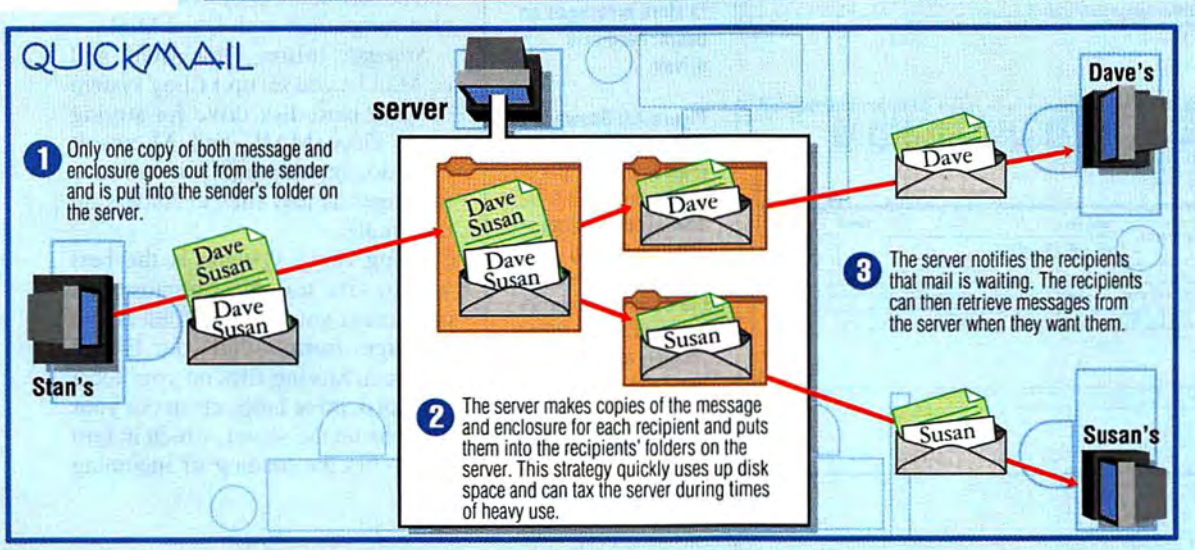
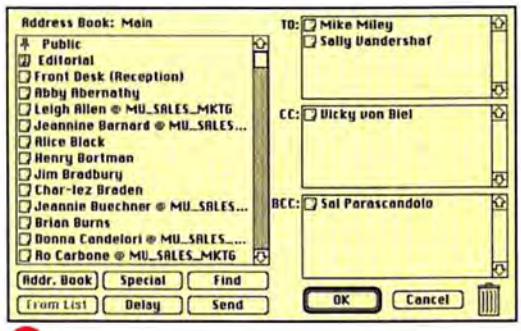
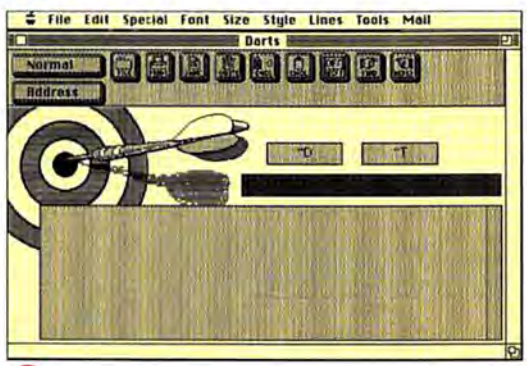

QUICKMAIL
server
Dave's
Susan's
Stan's
1 Only one copy of both message and enclosure goes out from the sender and is put into the sender's folder on the server.
2 The server makes copies of the message and enclosure for each recipient and puts them into the recipients' folders on the server. This strategy quickly uses up disk space and can tax the server during times of heavy use.
3 The server notifies the recipients that mail is waiting. The recipients can then retrieve messages from the server when they want them.
Dave
Susan

Figure 4: The Heavyweight Champ



4a

Figure 4a: Addressing mail in QuickMail is a process of double clicking on and dragging names into the To:, CC:, or BCC: fields. Alternatively, you can simply type the first character or two and then press Return to rotate the name through the copy designations.



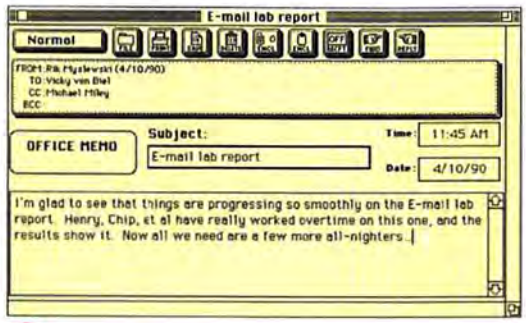
4b

Figure 4b: QM Forms lets users define their own forms and enclose graphics within them. It supports up to ten fields per form, and you can use numerous graphics tools to heighten design.



4c

Figure 4c: QuickMail supports a host of mail-management options. Mail can be sorted by normal and reverse sort, priority, subject, sender, and date; a Mail Log shows the status of sent messages; a Public bulletin board lets users post messages to the whole network; and personal folders can be set up to store messages on users' hard-disk drives.



4d

Figure 4d: Shown here is a typical QuickMail memo, with all the button options displayed for filing, printing, saving, deleting, enclosing a file or the Clipboard contents, requesting a receipt, forwarding a message, or replying.

those recipients. You can include the names of users from other servers and zones to address messages easily across servers.

For greatest efficiency, setting up group address books from the general names listing should clearly be a user function, as it is in DaynaMAIL, InBox, and QuickMail. In cc:Mail and Microsoft Mail, it's the job of the the E-mail administrator.

Keeping group lists current can be a problem. Only QuickMail provides a utility for verifying whether or not a group list is current. Microsoft Mail, which maintains a global directory, can't delete names from group lists as they're deleted from the global directory (although mail is not sent to deleted users).

Multiple enclosures. E-mail users often want to enclose more than one file with a message — copies of correspondence, for instance. InBox is limited only by available RAM in the number of documents you can enclose; QuickMail and cc:Mail permit 16 and 20 enclosures, respectively; and both DaynaMAIL and Microsoft Mail currently limit users to one enclosure only, a limit many find unacceptable.

A new product, StuffIt Deluxe from Aladdin Systems, allows you to circumvent this problem, and Microsoft Mail will soon allow you to automatically stuff documents into an archive so that multiple messages can be sent at once. StuffIt Deluxe is also compatible with QuickMail.

Storage. InBox, QuickMail, and cc:Mail let you set up a filing system on your hard-disk drive for storing mail. DaynaMAIL and Microsoft Mail do not, although you can save messages as text files in folders on the Finder.

Using filing systems is the best way to save text files, because you can access your storage folders and messages from within your E-mail program. Storing files on your local hard-disk drive helps clean out your mailbox on the server, which in turn speeds up the loading of incoming

mail and reduces the server's storage load.

Advanced Features

Forms. All the E-mail packages have a basic message form; InBox and DaynaMAIL also have forms for phone messages, and users of QuickMail and Microsoft Mail can design any form they want. Microsoft Mail and cc:Mail also let you display certain graphics — Microsoft Mail has a special form for this, and cc:Mail lets your Mac display Mac and PC graphics as enclosed files.

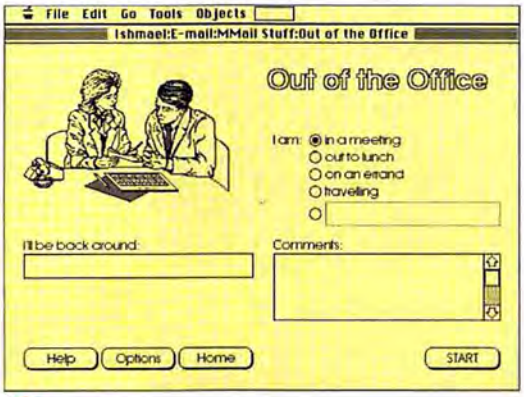
QuickMail and Microsoft Mail have optional forms that you can install in your E-mail system. You can also create customized forms. Microsoft Mail uses a HyperCard-based forms generator, and the administrator installs custom forms on the server. In contrast, QuickMail's QM Forms utility lets users install custom forms at their own workstations.

Being able to create customized forms is not just a user perk — when used in conjunction with databases and spreadsheets, this feature has great promise for both data collection and distribution. Indeed, QuickMail provides an add-on Data Collection bridge, and Microsoft Mail is developing a News Center HyperCard form for downloading and distributing online news, which can be earmarked for users by category.

QuickMail and Microsoft Mail are not limited to just the written word — both have a sound form that, when used with Farallon's MacRecorder or Farallon's new MediaTracks, lets you send recorded voice messages over E-mail. Microsoft Mail automatically installs Farallon's sound driver in the recipient's station if it's not already installed. Microsoft Mail's voice-message system also uses an automatic data-compression algorithm — a key feature, because sound files tend to be large. QuickMail will add this feature in subsequent releases.

Fax and E-mail. E-mail allows you to send messages directly from a

Figure 5: The Light-Heavyweight Champ



5a

Figure 5a: Microsoft Mail employs its HyperCard-based Forms Designer for creating forms. Here's a form under design that includes line art.



5b

Figure 5b: Like cc:Mail, Microsoft Mail supports color display of images. This color PICT image shows the space shuttle *Challenger* orbiting the earth.



5c

Figure 5c: The small status icons to the left of the From field show, from top to bottom, a message with an enclosure sent directly from Microsoft Word, a return receipt, an image, a phone message, and a message with an enclosure.



5d

Figure 5d: Voice messages up to 60 seconds long are supported in Microsoft Mail (as they are in QuickMail). Voice messages can be compressed at a 4:1 to 8:1 ratio, the ratio being determined by the administrator.



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Please circle 135 on reader service card.

Mac through any fax modem hooked up to a network; cc:Mail, Microsoft Mail, and QuickMail all support this function.

Interapplication communication. QuickMail and Microsoft Mail have begun the process of integrating mail with other products. QuickMail lets you put a Mail menu onto any application's menu bar, so that you can quickly enclose your current active file within a memo. Microsoft, on the other hand, has taken the road of integration at the API (application-programming interface) level and has integrated Mail with Word and Excel. If you are using either of these programs when you open your mail, you can fetch the enclosed file and read it immediately from within Mail.

Real-time conferencing. QuickMail is currently the only mainstream Mac mail package that allows you to have a real-time conference with other network users, even across zones and local servers. In Conference mode, one user talks (types) to another user without going through the server, and users can save a log of their conversations. (This feature is similar to Flash from Beagle Bros, which lets users chat back and forth, as well as transfer files, without using the server as an intermediary.)

Reaching Out

Extensibility. An E-mail system quickly becomes obsolete if it cannot be expanded. Not only do you need to be able to add more users easily, but you also need to be able to split your mail service among different servers, across zones, and even to remote locations.

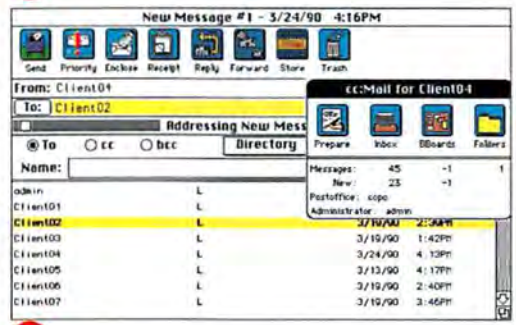
Server-to-server communication. An internet consists of several linked LANs, which can be extended by routers and bridges. Server-to-server communication requires that one server knows when and where to deliver mail to other servers, both locally (in the same building) and remotely (over phone or dedicated lines).

In order to have server-to-server

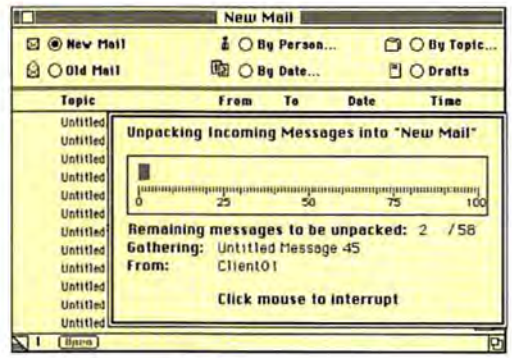
Figure 6: The Contenders

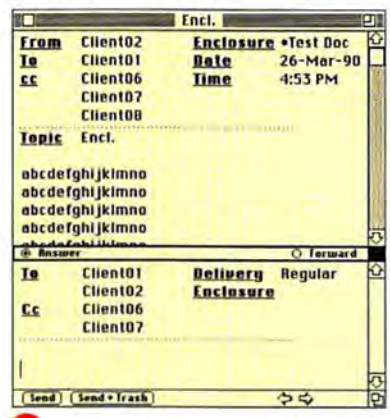


6a



6b





6c

Figure 6a: This composite InBox screen shows four key features: the message window showing status icons for regular and phone messages, return receipts, urgent messages, already read messages, and messages marked for deletion; a phone message; the keypad for message manipulation; and the MultiFinder "toggle" (the InBox button).

Figure 6b: cc:Mail supports color, both in its interface and in enclosed graphics files. Shown here are cc:Mail's in-box message pad and the normal listing for incoming mail. cc:Mail has many options for message management, receipts, reply and forward of mail, storage, and public messages.

Figure 6c: DaynaMAIL has good mail-management functions and allows you to view your incoming mail by new, old, person, date, and topic and to store drafts for future editing. When you get a list of mail, DaynaMAIL first unpacks the messages — a long message list takes a long time to process. Shown also is DaynaMAIL's split-screen reply strategy, useful for replying to mail.

communication in DaynaMAIL and cc:Mail, you need a PC to do the linkup. DaynaMAIL also requires you to purchase MHS (Message Handling System) from Action Technologies, of Emeryville, California, for server-to-server communication. cc:Mail currently makes you buy both its DOS version to do setup and administration and its cc:Mail gateway for server-to-server linkup.

InBox Plus, Microsoft Mail, and QuickMail are able to establish multiple servers, although you have to purchase additional server software because each server is serialized on the network.

The QuickMail administrative software provides the most-elaborate options for tweaking local or remote server-to-server connections, including the ability to adjust the length of the intervals between server-to-server file forwarding, the transmission rates for modem dial-up, or the log-on times for making connections to commercial services. Subsets of these features are available in other packages as well.

Multiplatform clients and servers. All the E-mail packages (except DaynaMAIL) currently provide support for Mac as well as PC clients on the same network. On the other hand, because DaynaMAIL and cc:Mail run on top of any AppleTalk-compatible file server, any platform that can be hooked up to a LocalTalk network and is compatible with products such as DaynaNET, AppleShare, TOPS, or NetWare can be used as a server. Microsoft Mail now has VAX servers available from both Alisa and Pacer.

Remote access. Only QuickMail has a specific program for sending and receiving messages from a remote location. It's possible, however, to send and receive messages from a remote server with any E-mail program by using a standard telecommunications program for terminal emulation and at least a 2,400-bps modem. This communication method

Table 2: Emulators and Gateways

	cc:Mail 1.1	DaynaMAIL 1.01	InBox Plus 3.0	Microsoft Mail 2.0	QuickMail 2.2.2
Terminal emulators (client to server)	none	none	none	none	GEnie INET MCI Mail The Source Telcom Bridge Telemail
Gateways (server to server)	All-in-1 EasyLink FAXgate MCI Mail MHS PROFS Quikcom SMTP/UUCP SNADS/DISOSS Telemail VMS Mail X.400	MCI Mail MHS Soft-Switch X.400	FAX MHS PROFS SMTP VMSmail X.400	AppleLink DEC Message Router FAX MCI Mail SNADS UNIX SMTP VMS Mail X.400	Connect FAXgate QM Gator Mail Q INET Mailmate QM Mailstation Glue MHS QM Connect Gateway QM Data Collection Bridge QM Link Gateway QM MHS Gateway QM Professional Gateway QM Serial Gateway Touchmail (for X.400) Vines MacMail

Table 2: E-mail vendors are developing a host of emulators and gateways for E-mail systems. CE Software has written terminal emulators for on-line services that allow clients to log on as typical users from within QuickMail. Accounts are maintained at the QuickMail server, and dial-up occurs at predesignated times.

For the most part, the gateways allow true server-to-server communication between dissimilar E-mail systems. Gateways can be configured for specific dial-up intervals and times. Full listings of gateway prices and companies are available from the E-mail vendors and are being updated regularly.

can be time-consuming, though.

QuickMail's Quick Remote telecommunications package lets you dial directly into your E-mail system and pick up and deliver your mail, but it's slow and doesn't provide you with many of the capabilities you get with your in-house DA.

Gateways. LAN-based E-mail can connect to commercial mail systems, such as MCI and CompuServe, and corporate mail systems, such as PROFS (which, incidentally, includes the infamous Undelete feature that contributed to Colonel Oliver North's embarrassment). There are two ways to make such connections: using a terminal emulator that allows client access to the remote server, or using a gateway that allows your local LAN mail server to speak directly to the remote mail server (see Table 2).

Emulators are easier to write than true gateways — writing to them is like configuring a telecom package's log-on sequence. Gateways, which require time-consuming programming at the API level, are available from several developers.

The two approaches are very different. Every terminal emulation requires that a separate account be maintained at the mail server. If many users have their own MCI accounts, for instance, and they all try to send mail at the same time, multiple connections are made with MCI simultaneously and the local server can quickly be brought to its knees.

A gateway, on the other hand, allows numerous clients to access a server through a single channel. QuickMail leads the pack in the number of emulators it provides, but gateways for all the E-mail packages are available, with more appearing all the time.

Future Directions

Now that E-mail on the Mac has achieved reasonable performance and reliability, vendors are beginning to tackle other issues such as multiplatform communication, links to other mail systems, and the implementation of X.400 WAN standards. We can expect E-mail to expand soon from messaging into such areas as automatic document transport, archival systems, and automated invoicing and data collection.

E-mail will soon be more than just simple text messaging, offering a rich array of electronic objects such as voice, images, and text in complex multimedia documents. With faster networks, the transporting of such complex objects will become commonplace. But these advancements are still in the future. To find out what the best E-mail choice is today, see "The Bottom Line," where you'll find MacUser NetWorkShop's picks and pans.

Michael Miley is an associate editor for MacUser Labs who had a spiritual life prior to researching electronic mail.

The Bottom Line

Soon after we began testing the five most prominent E-mail systems, it became clear that this was a two-horse race. A month of simulated office chatter confirmed our suspicions: When picking an E-mail system, look first at CE Software's **QuickMail 2.2.2** and **Microsoft Mail 2.0**.



QuickMail is a fast, powerful, and full-featured E-mail package with loads of features for both user and administrator. CE Software seems to have anticipated every E-mail need — or whim. QuickMail isn't perfect, however. It would earn at least another half mouse if it fixed its inefficient multiple-message strategy. It's not unusual for a user to get a "server busy" message while QuickMail is grinding away, replicating messages and enclosures on the server. Larger networks can get into problems if they don't allocate a large enough hard-disk drive, and weekly backup and restore (for hard-disk defragmentation) is a must.

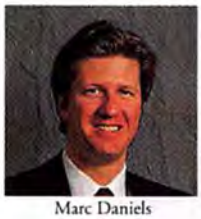
Close behind QuickMail — very, very close — is Microsoft Mail 2.0. Mail is lean and mean — although maybe a bit *too* lean. Its client/server relationship is fast and efficient, and if the package were more full-featured, it would clearly be the winner. If you can put up with a limited set of features for the time being, you may ultimately win out as Microsoft adds to Mail's power. Mail 2.0 is spartan today, but it may be the near-future choice for companies gearing up for large E-mail systems — especially those that benefit from Mail's integration with Microsoft Word and Excel.

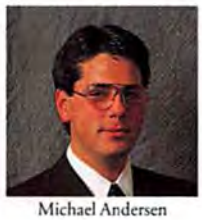


For TOPS buyers, the basic **InBox** package is a can't-be-beat bargain: It's free. Users who like the program can upgrade to Sun Microsystems InBox Plus 3.0 for a marginal cost, and they'll find it to be a good, solid product with more user goodies than Microsoft Mail. InBox's client/server design could use some rethinking, however.

We can't recommend **cc:Mail 1.1** and **DaynaMAIL 1.01** in their current incarnations. Although cc:Mail has earned a solid reputation in the PC world, its lack of a Mac-based administrator package makes it not ready for prime Mac time. We'd also like to see more-competitive pricing: There are too many hidden costs for Mac-centric LANs. PC networks that are already running cc:Mail, however, and want to add Macs to their network will find cc:Mail for Macintosh to be a reliable partner.

Finally, DaynaMAIL's designers need to go back to the drawing board. DaynaMAIL is touchy to set up, slow to use, and still shaking out the bugs. We advise users who are attracted to DaynaMAIL's distributed, serverless option to investigate a low-cost alternative such as Flash. For a lot less money ($100 for unlimited users) and hassle you can have point-to-point file transfer and simple messaging.


Marc Daniels


Michael Andersen


Paula Zeig-Gehl


Ed Casey


Chuck Sullivan


Kelly Warren


Barbara Gasparetti


Brian Hoppaugh


Ana Diaz


Chris Deschu


Carolyn Douglas


Tina Ferensic


Robin McAteer


Lori Schaible


Gregg Getchius


Denise Moran


Steve Peckman


Sherwin Miller


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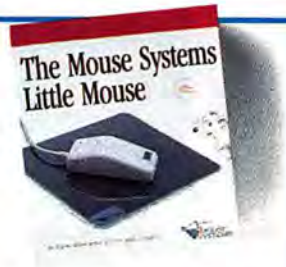
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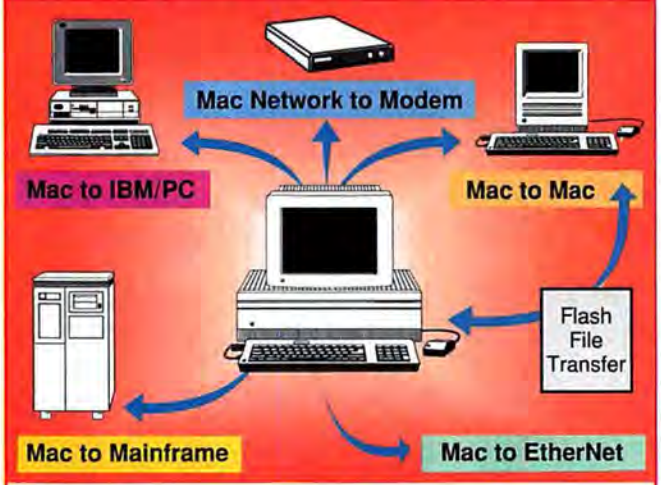
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Character Witnesses

AccuText and OmniPage — the big names in automatic OCR — take the stand to see who's the best judge of character.

BY PHILLIP ROBINSON AND THE MACUSER LABS STAFF

A lot of the information that people want is already in print somewhere — in a book, magazine, newspaper, or report. The problem is getting the information off the page and into your Mac, ready to be edited, analyzed, tweaked, and processed. What you need is a way to convert spots of ink on a page into bits of electricity in a chip. What you need is optical character recognition, or OCR.

OCR enables computers to "read" documents by optically scanning a page and then finding and identifying the characters on that page. The result is an editable word-processor or spreadsheet file.

Early OCR programs for the Macintosh were



PHOTOGRAPHY: ROBIN GINSBERG

designed with rigid rules that allowed them to recognize only a very few fonts, type styles, and sizes. Then came "trainable" OCR, which you could teach to recognize almost any font by showing it what typical characters looked like (see the "Trainable OCR" sidebar). These programs use pattern matching, isolating a possible character and overlaying it with a known character pattern until a match is made — a process similar to comparing fingerprints.

Automatic, or "omnifont," OCR was the next step. These programs don't need to be trained to recognize particular fonts or styles (hence *omnifont*). Instead, they work with more-general rules and can recognize characters in a variety of type sizes and styles by means of a cluster of algorithms.

Figure 1: Fax

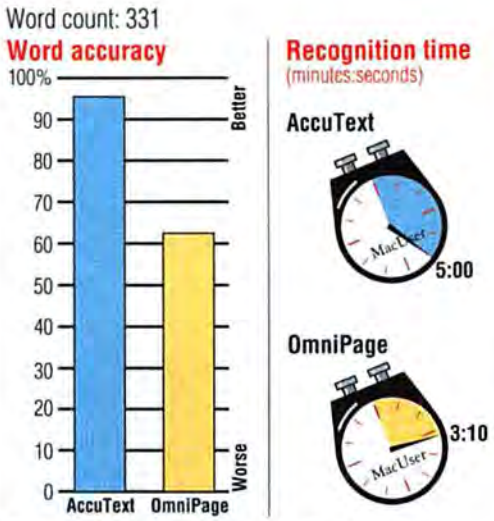


Figure 1: AccuText performs better than OmniPage when recognizing characters on poor-quality pages, such as dark photocopies and original fax copies.

Figure 2: Textbook

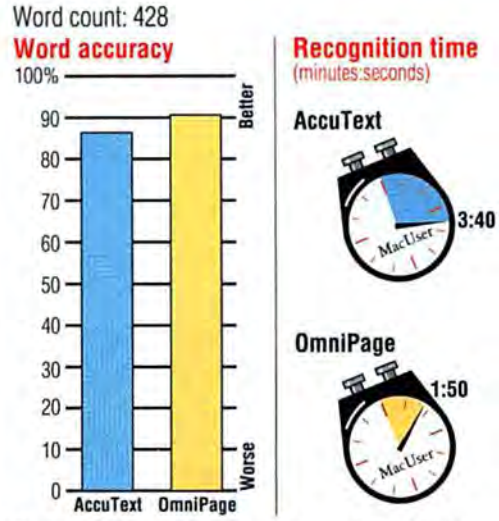


Figure 2: OmniPage was much faster and had slightly better accuracy than Accutext when scanning a technical document, but Accutext was better at catching details such as subscripts.

The algorithms behind these rules come from artificial-intelligence research. They compare the dot patterns on a page with their stored knowledge about character shapes. Instead of the strict pattern matching of a trainable OCR program, omnifont OCR programs extract and then analyze a character's features. That is, instead of depending on exact matches with stored patterns, they have a general understanding that a *P*, for instance, has a vertical stroke and an enclosed area on the top right of the stroke. Such understanding isn't stumped by changes in type style or size.

Based on such feature analysis, an omnifont program can make an educated guess at a character's identity. More-advanced omnifont OCR programs include page- or document-recognition software that can recognize page layout, distinguish text from graphics, and grasp the format of the text (see the "High-End Systems" sidebar).

AccuText from Xerox Imaging Systems and OmniPage from Caere are the major players in automatic OCR. Both programs are designed to look at a page and recognize some format details: They can distinguish between graphics and text; and within the text, they can recognize columns, headlines, and titles.

However, AccuText and OmniPage have somewhat different strengths. OmniPage is optimized to recognize high-quality print, such as complex magazine pages that contain several fonts, graphic elements, and irregular columns.

AccuText works best with longer, poorly printed documents, such as second- and third-generation photocopies. It was designed to tackle multipage documents, such as manuals and financial reports.

Context versus Feature Analysis

The two programs approach page recognition from different angles. OmniPage fits a whole scanned page into RAM and starts by squinting at the page to find and peel away graphics; it then locates column edges, line spaces (including variable spaces containing large initial caps), and characters. Each isolated character is put into a box, and its shape and features are analyzed. If the character's identity isn't obvious, it's rotated in the box and retested.

As characters are identified, OmniPage adds them to a pool of learned characters, which speeds up recognition. It then makes a second pass at the page, returning to tough characters and using what it has learned to try to crack their identities. When OmniPage can't recognize a character, it substitutes a special symbol, usually a tilde (~), in the output file.

OmniPage doesn't make guesses based on word context. In other words, it doesn't

Trainable OCR

If you're going to scan a lot of text with only a few fonts, a trainable OCR program can be your best choice.

After some practice, trainable OCR programs can recognize almost any font. You show the program what a font's typical characters look like by working through a sample page — this is an *a*, this is an *f*, this is another *a*, this is a comma. Training can take anywhere from 15 minutes to a couple of hours.

Trainable programs demand less system hardware than automatic programs do — they can work on any Mac with 1 megabyte of RAM — and if you're willing to set aside some training time, you can achieve speedier scanning and better accuracy than with automatic OCR programs.

TextPert 3.01 isn't the easiest program to train, but it does support a wide range of languages and alphabets, and it has some of the most flexible file-input and -output options of any trainable OCR package.

Version 3.5, scheduled for release after press time, offers better speed and greater

Figure 3: Magazine Page

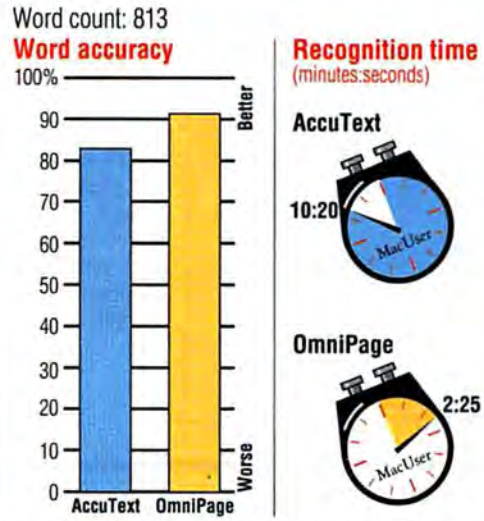


Figure 3: On a complex, color magazine page, OmniPage delivered a lower error count but AccuText was better at distinguishing graphics that were placed close to the text.

Figure 4: Legal Document

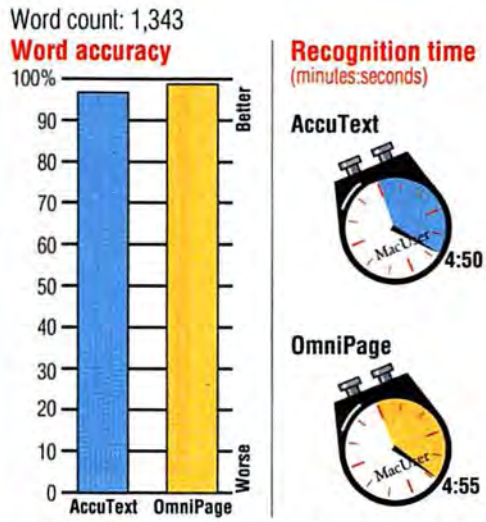


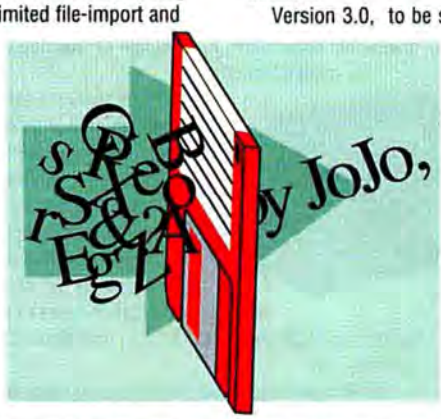
Figure 4: On a legal document, both programs failed to separate the line numbers on the left from the rest of the text. Accutext was faster than OmniPage, but it deleted a dozen words.

refer to a dictionary and then speculate on a character's identity by its context within a word. As a result, OmniPage seldom substitutes the wrong character in a word; instead it inserts the unknown-character symbol wherever it isn't sure. It's then a simple process to search for unknown characters and fix them, using a word processor's spelling checker.

AccuText begins its analysis by examining an entire page, much as OmniPage does. As it moves through the page, it

accuracy through new algorithms, more scanner drivers, and improved dot-matrix reading. TextPert also allows you to easily export database-format files.

ReadStar II Plus 1.06 can be confusing to train, and it has limited file-import and -export choices. It needs 2 megabytes of RAM and is copy-protected. Once it's trained, however, ReadStar is very fast, beating most of the trainable and automatic programs.



TextScan 3.04, one of the least expensive OCR programs, comes with a dictionary and pretrained character tables. It can work on PICT files, and version 3.04 provides better dot-matrix recognition than earlier versions did.

Read-It! OCR 2.1 is inexpensive and easy to train, has lots of editing and training options, and runs in the background under MultiFinder, but it isn't particularly fast or accurate.

Version 3.0, to be shipped in the third quarter of 1990, will add automatic graphics- and text-separation capabilities and character-recognition features for typical office documents. It should also be considerably faster.

ReadForm, a superset of Read-It! OCR, will also ship in the third quarter. It will be able to scan and recognize typewritten and block-text handwriting on typical office forms and output the results into database format.

Olduvai Corp.
7520 Red Road, Suite A
South Miami, FL 33143
(800) 822-0772
ReadForm, $695
Read-It! OCR 2.1, $495

Innovatic, Inc.
1911 N. Fort Myer Drive, Suite 708
Arlington, VA 22209
(703) 522-3053
ReadStar II Plus 1.06, $995

CTA, Inc.
747 Third Ave., Third Floor
New York, NY 10017
(800) 252-1442
TextPert 3.01, $995

Prism Enterprises, Inc.
14703-E Baltimore Ave., Suite 248
Laurel, MD 20707
(301) 604-6611
TextScan 3.04, $395

learns the text shapes and adjusts its recognition, based on new information. It learns from clearly printed sections of the page what characters look like and then applies that knowledge to areas that are not printed as clearly. AccuText recognizes the easy marks early on and postpones the tough guesses until it knows more about the page.

AccuText uses a multilevel expert system for page segmentation, character recognition, and format analysis. The character-recognition expert has several parts. One works on well-formed characters' geometric properties. Another uses learned information about the page to separate touching characters — realizing, for instance, that the letter pair *in* is too wide to be a single *m*. AccuText also has an expert system to deal with character attributes such as italics, underlining, superscript, and subscript.

A large part of AccuText's intelligence comes from its lexicons — dictionaries of properly spelled words and probable character sequences — available in seven languages. The English lexicon contains 50,000 words (more if you add your own user lexicon) and syntax rules, such as likely word endings, and letter/number combinations, such as *1990s* and *1st*. These syntax rules help AccuText guess the probable identity of questionable characters.

AccuText's lexicon checking gives it a stronger tendency than OmniPage to substitute incorrect characters. It also makes AccuText run more slowly, because it's trying harder to make sense of difficult characters. On a magazine page, this results in AccuText's recognizing headlines or headings over columns — styles of text that don't offer many examples for learning and comparing on a single page.

Because AccuText is designed to deal with long documents, it sees and learns from a larger text sample than does OmniPage. This means, however, that it can be prone to committing errors in short documents.

OmniPage also offers context-based recognition through an optional product called OmniSpell. Still in beta at press time, OmniPage with OmniSpell is designed to look at all the recognized words in a document and compare them with a dictionary stored on-disk. It can then change a questionable character's identity within a word to match a dictionary entry as well as report how many words will change in this way. You can then make all the changes at once or pick

Figure 5

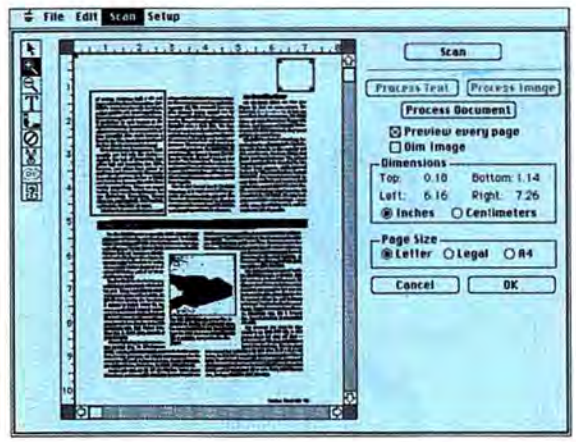


Figure 5: AccuText's Preview window allows you to decide which areas on the page to ignore, which to recognize as text, and which to save as graphics.

High-End Systems

If you're using OCR to scan and recognize hundreds or thousands of pages, you'll want, at the very least, an automatic sheet feeder on your scanner and a fast OCR program in your Macintosh. If that's not enough and you don't want to sacrifice your Mac to full-time OCR work, there are other options: Calera Recognition System's TopScan for the Macintosh or Caere's new Parallel Reader.



TopScan for the Macintosh is a software package designed to work with Calera's CDP (Compound Document Processors) series. Including the hardware, TopScan models range in price from about $20,000 to $32,000. The software alone costs $2,995.

TopScan is a document-recognition program — it's able to distinguish between text and graphics, and it can understand a document 's underlying format. It also has a unique approach to batch processing — users can scan numerous documents during the day, save the results, and then defer character recognition until the evening.

TopScan's features include an image-preview window that lets users create templates of page regions with customized settings, a postview option for checking scan quality before exporting the pages to the desired application, and style sheets for output documents that allow users to duplicate or override an original document's format.

The $11,000 Parallel Reader is a dedicated box consisting of four plug-in OCR processor boards, each with its own CPU and 2 megabytes of RAM, and software that guarantees fast character recognition. Its speed is staggering: It can work on four separate scanned page images at the same time. You can add a network card in order to make the Parallel Reader an OCR server for PCs or mainframes, and a scanner interface card.

The Parallel Reader can simultaneously save text and graphics, set recognition zones on a page, batch-process from stored TIFF files, and flip a stack of scanned pages for double-sided collations.

Both TopScan and the Parallel Reader have the potential to make heavy-duty OCR a procedure that is no more exotic than using laser printers or file servers.

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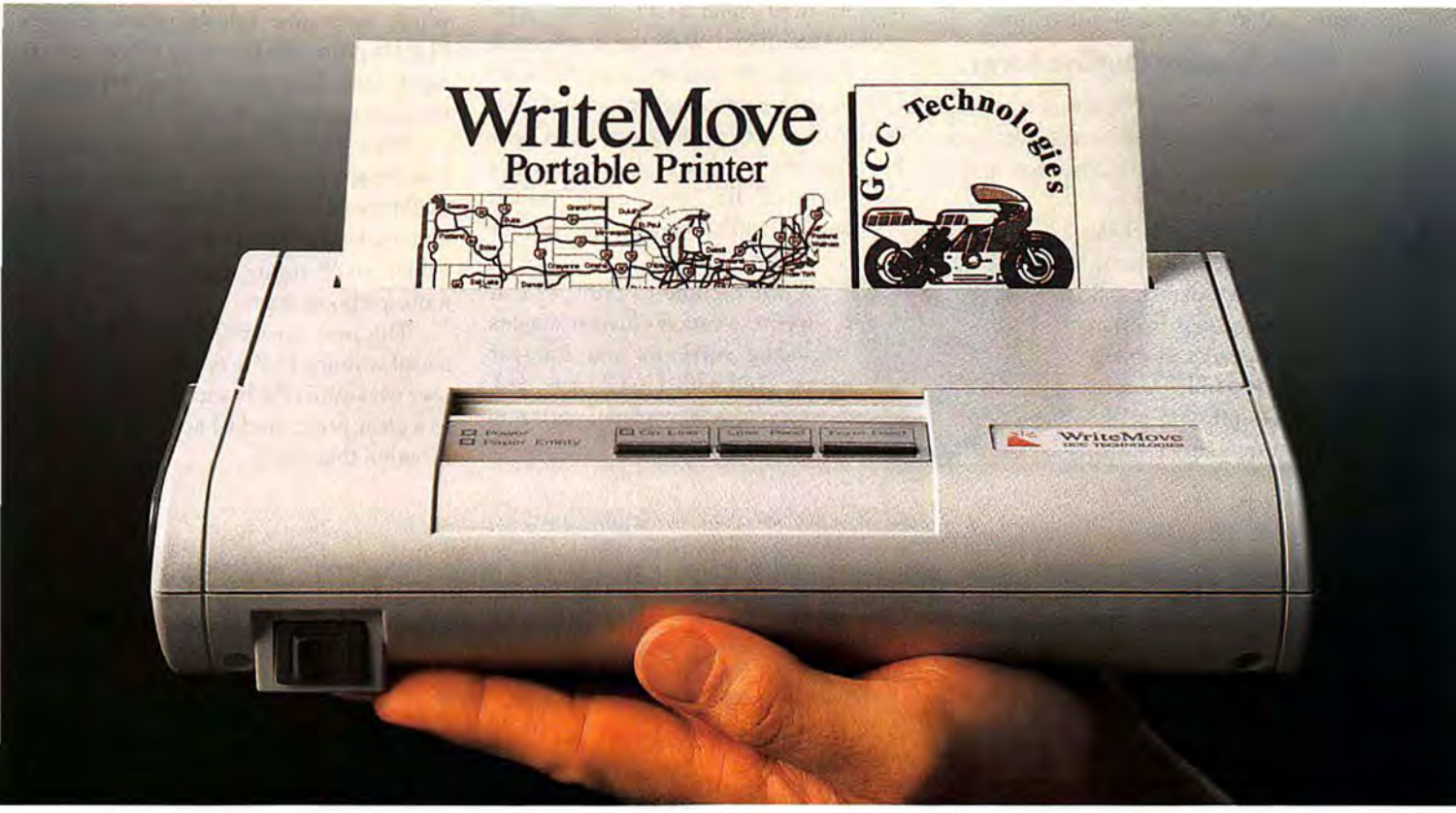
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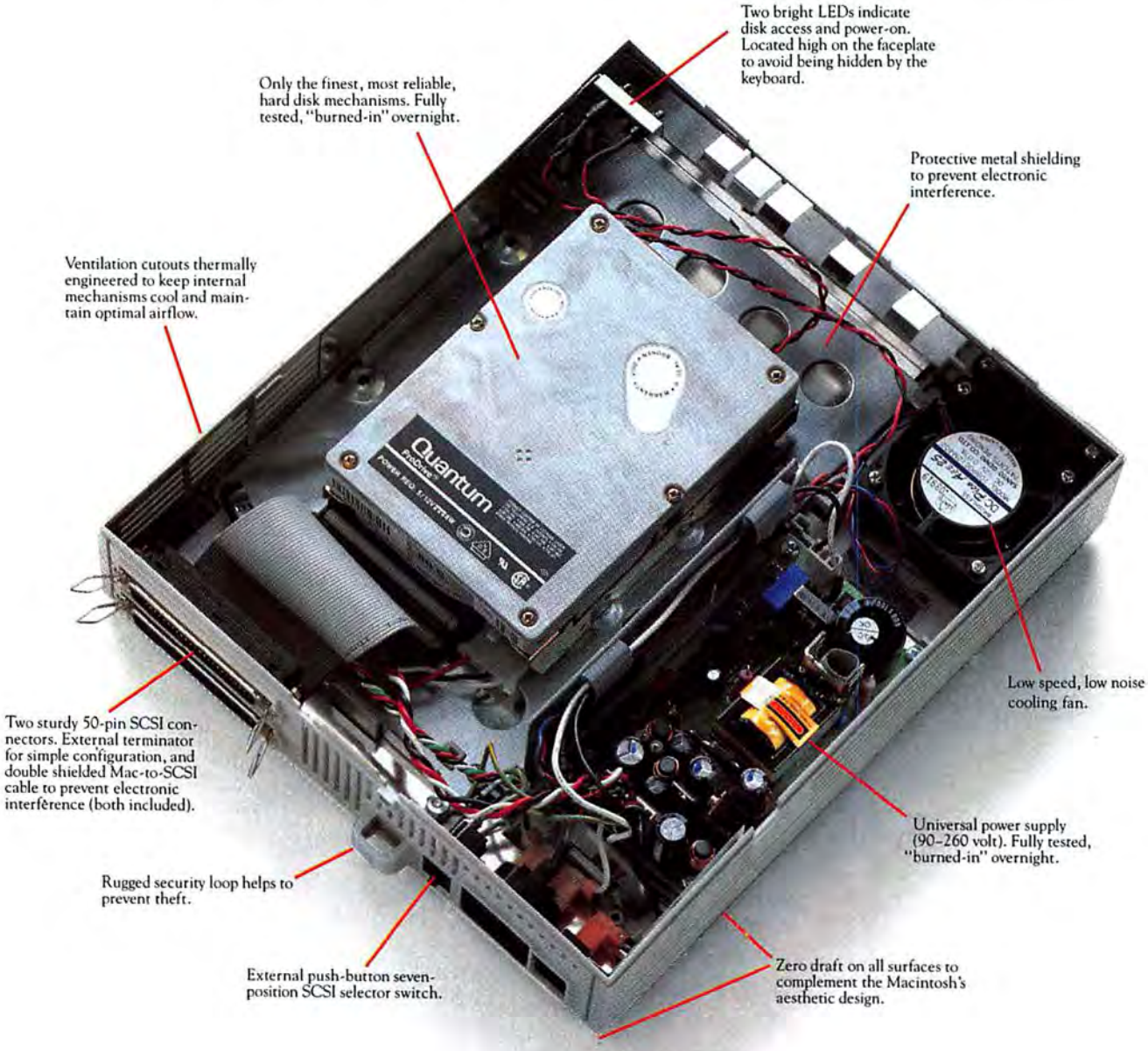
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Character Witnesses

through them interactively.

OmniSpell can also build a user dictionary of proper names and technical terms for a document — either interactively or by importing a text file — and it can export its user dictionary for use with other spelling checkers.

Format

Working on the assumption that users are more interested in the information contained within a document than in its layout, OmniPage doesn't replicate a page's exact layout. Although it can automatically recognize multiple columns on

The Best Scanners

A poor-quality scanner can sabotage the efforts of even the best OCR program. For instance, if there's inadequate contrast between text and background, character forms can break up. If there's too much contrast, adjacent characters will join together. And low resolution can make it difficult for the program to recognize small characters or characters containing fine lines.

In order to test the quality of the 21 most popular scanners, MacUser Labs scanned a document composed of normal contrast text, very light and very dark text, and a faxed document. Each test was performed on white, brown, goldenrod, blue, and yellow paper.

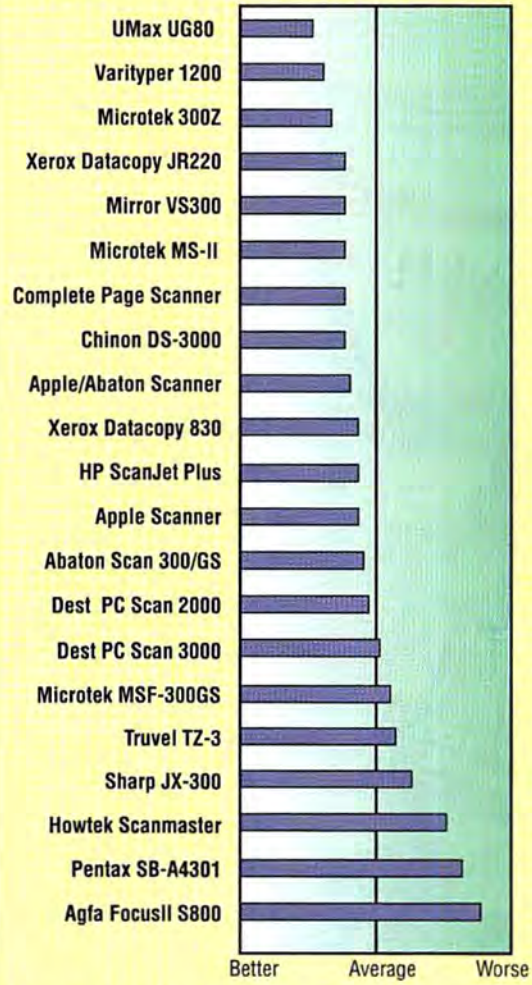
The scanners were set at 300-dpi resolution (typical laser-printer quality), line art, and 100-percent scaling. We initially selected default contrast and brightness levels (except when auto-thresholding was available), but some scanners displayed such poor image quality at default settings that we had to adjust the brightness level.

We used OmniPage 2.1 to read the scanned images, and we used a spelling checker to count the number of misspelled words in the final file.

The error count didn't vary widely among the scanners. We did have to tweak the brightness settings on some scanners to achieve these results, however — of the top three scanners, only the Varityper 1200, with its excellent auto-threshold feature, required no adjustments to the brightness control.

If you're going to do a large amount of scanning for OCR, you'll probably need a multisheet-feed scanner — such as the Microtek MSII or the Xerox Datacopy JR220 — or a flatbed scanner with an optional multisheet feeder, such as the Xerox Datacopy 830.

— John Price



Comparing scanner output quality showed an average of 82 word errors on a complex page.

a page, it doesn't report the results in the same format. For instance, OmniPage reports side-by-side columns in the original document as sequential columns in the final output.

AccuText holds on to more of a document's format than OmniPage does. It can even create style sheets for Microsoft Word. When faced with keeping the file as easily editable as possible or forcing it to look like the original, however, AccuText opts for editability. For instance, AccuText can reproduce a table's format with tab stops between columns, but it cannot include any additional spaces that even out on-screen character spacings and positions.

Figure 6



Figure 6: AccuText lets you decide how some recognition errors should be marked and which text styles should be saved in the results file.

Features

AccuText's settings and menus are more focused and economical than are OmniPage's. You can specify column settings, page settings, and recognition settings, such as numbers only, letters only, or alphanumeric. You can also decide whether or not to use context verification. You can save scanner settings, such as those for brightness and resolution, in a file on-disk.

One of AccuText's best features is its Preview window, which lets you customize settings for different areas of a document, as well as choose how much of the page to scan. Unfortunately, these settings can't be saved as a template. Final text output can be saved as Microsoft Word, MacWrite, text, or Excel files, and scanned images can be saved as TIFF, MacPaint, or PICT files.

You have to deal with twice as many menus in OmniPage. The Defaults menu offers choices for 11 European languages, 17 scanner models, contrast, size, scanner resolution and tone, and scan area, as well as text defaults. You can also choose whether to display statistics on accuracy at the end of the file. One nice feature that OmniPage offers is the capacity to "invert" the data (print white on a black background).

OmniPage's Preview window allows you to zoom in or out to view text or graphics, which is useful for checking your scanner settings but doesn't allow you to limit the scanning area.

When OmniPage has read each page, it places the results in its Transitional Edit window, which offers search-and-replace commands and an error-checking option for finding and manually fixing recognition errors. Finished files can be saved as text, MacWrite, Microsoft Word, WordPerfect, or Excel files. Images can be saved as PICT, MacPaint, or TIFF images.

In addition to OmniSpell (mentioned earlier) for context verification, OmniPage also has several optional add-on programs: OmniDraft for low-quality dot-matrix prints; OmniProof to compare documents; and OmniTrace, which converts bit maps to PostScript graphics.

OmniProof can show you how two versions of the same document differ, and it can generate summary reports of the differences, which is useful in testing the accuracy of your OCR files. OmniTrace inserts itself into OmniPage as another menu option. It converts bit-mapped and TIFF files into EPSF files that can use Bezier curves and vectors.

Performance

Automatic OCR is a difficult process, and it demands some powerful hardware: You'll need at least an SE with 4 megabytes of RAM and a hard-disk drive. Both AccuText and OmniPage are designed to drive a scanner directly and to recognize the files produced as well as to translate TIFF files created or captured elsewhere.

A surprising difference between the programs is how they handle multipage documents. With AccuText, you must respond to a prompt after every sheet, whereas OmniPage handles the pages



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Figure 7

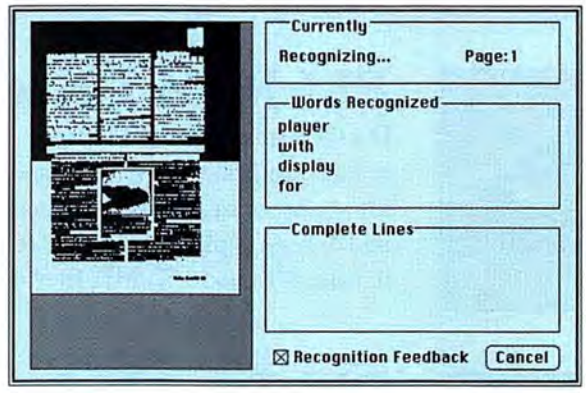


Figure 7: As it works through a page, AccuText shows a graphic image of its progress, including words and complete lines that have been recognized.

Figure 8

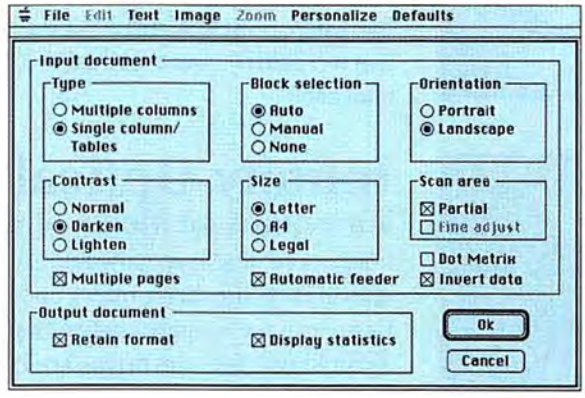


Figure 8: OmniPage packs all of its text-recognition settings into a single dialog box. If you don't have OmniDraft, an optional module that enables OmniPage to read dot-matrix text, the Dot Matrix option is grayed out.

without interruption. Yet AccuText is supposedly designed for multipage work.

Because it learns as it goes, AccuText should accelerate while working on a long, homogeneous document. When MacUser Labs charted both programs for rate per page, however, there was no clear trend: Neither OmniPage nor AccuText gets noticeably faster over the length of a document.

Comparing Performance

To justify its cost, an OCR program should be faster and more accurate than a typist. Measuring a program's speed and accuracy depends on the complexity of the document you're asking it to read, including such aspects as the paper it's printed on and the layout, type size, and skew angle.

In our tests, OmniPage was usually faster than AccuText and won most of the accuracy comparisons. It was more skew-resistant, keeping its accuracy even when a page was angled by as much as 5 degrees — AccuText's accuracy dropped precipitously with such a skew. There were a few cases in which AccuText matched OmniPage's time, however, and poor-quality pages, such as dark photocopies and fax copies particularly, hurt OmniPage's accuracy far more than AccuText's (see Figure 1).

In general, the tests showed that both programs fare better with photocopies of pages than with originals — possibly because the photocopy smooths lines, connects neighboring dots, and reduces glare from the page surface.

Both programs had difficulty recognizing equations, and neither could produce an acceptable result when scanning a technical document with equations. OmniPage was twice as fast as AccuText

Figure 9

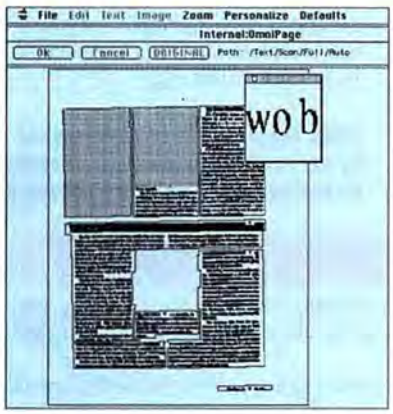


Figure 9: OmniPage displays the page image and a small character window as it works. When text blocks on the page are recognized, they're filled in with a pattern. The small window lets you see the scan's quality in detail.

Figure 10

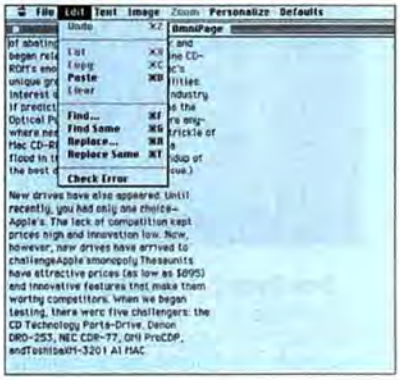


Figure 10: After scanning a page, OmniPage initially saves the text in a Transitional Edit window that includes search-and-replace functions. This lets you see the quality of the OCR work without having to open it in a word-processing or spreadsheet program.

when scanning the technical document, and it had slightly better overall accuracy, but AccuText was better at catching subscripts (see Figure 2).

On a simple magazine page with few graphic or text elements, both programs failed to deliver an accurate rendition, and AccuText took more than ten minutes to do a poor job. OmniPage was more accurate, but AccuText kept the text blocks in order better. Changing the scanner settings for brightness and contrast didn't improve either program's accuracy. A competent typist could sit at the keyboard and key in a page faster and more accurately than this. Both programs worked better with a photocopy of the page, with OmniPage reaching reasonable accuracy in a little more than half the time AccuText took.

On the complex magazine page — with three columns wrapped around circular and angled graphics — both programs took the same amount of time. Although OmniPage delivered a lower error count, it had more trouble distinguishing graphics that were placed close to the text (see Figure 3).

On legal documents, both programs did a good job, although they had some trouble keeping the line numbers on the left separated from the rest of the text. AccuText was actually slightly faster than OmniPage — consistent with Xerox's claims that longer documents produce better results — but it deleted a dozen words (see Figure 4).

On a 20-page document, OmniPage was faster, averaging 57 characters per second; AccuText averaged only 32. But OmniPage had some 10 seconds per page of overhead, whereas AccuText gave up only 5 seconds per page.

On average, OmniPage won on speed

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Character Witnesses

and AccuText came out slightly ahead on accuracy. However, OmniPage's accuracy suffered severely when it worked with poor-quality prints, such as dot-matrix, fax, and dark photocopies, and AccuText's speed was affected when dealing with complex documents, such as scientific or technical documents.

Whichever OCR program suits you best, arm yourself with a good spelling checker and don't expect 100-percent accuracy or a perfect replica of your original document. OCR can be practical, but it isn't yet perfect.

Phillip Robinson is a computer writer and former research-and-development engineer. His goal for the 1990s is to be a mad scientist.

The Bottom Line

Our testing showed that **OmniPage** is generally faster and more accurate than **AccuText**. It handles multipage documents better, and it supports more scanners and languages.

AccuText is a better choice if you scan a lot of poor-quality pages or you want to capture specific parts of a page. It also preserves more of the page format than OmniText does.

Both programs achieve greater speed and accuracy when scanning a photocopy instead of an original, but you'll still need a good spelling checker to clean up the results.





AccuText 1.1 ★★★★

AccuText is an automatic, omnifont OCR program built on a squad of expert systems that combine shape and context analysis, working from a lexicon of correct word spellings, common word endings, and probable letter and number sequences. Its forte is reading poorly copied, multipage documents.

Pros: Can read poor-quality prints and photocopies. Has Preview window for manually selecting and arranging blocks of text to recognize. Preserves more of a page's format than OmniPage.

Cons: Slower and less accurate on most pages than OmniPage. No built-in editor for viewing recognized text before saving to a file.

Requires: SE with 68020 accelerator card, or SE/30 or later with 4 megabytes of RAM (5 megabytes under MultiFinder) and a 20-megabyte hard-disk drive. System 6.0 or later, Finder 6.1 or later, and MultiFinder 6.0.

List Price: $799.

Xerox Imaging Systems, Inc., 535 Oakmead Parkway, Sunnyvale, CA 94086; (800) 248-6550.

OmniPage 2.1 ★★★★½

OmniPage is an automatic, omnifont OCR program. It can read a wide range of documents, but it works best on complex magazine pages. Its strict adherence to shape analysis — without AccuText's dependence on lexicons — avoids most substitution errors. You can extend its use with the optional programs OmniSpell, OmniDraft, OmniProof, and OmniTrace.

Pros: Fast and accurate on most pages. Supports more scanners, languages, and output file formats than AccuText. Is able to read pages placed in or on a scanner at an angle. Optional programs provide context analysis, document comparison, dot-matrix-print recognition, and conversion of bit-mapped graphics to object graphics.

Cons: Not good on poor-quality prints and copies; little manual control of text-block shape, position, or recognition order; preserves little of a document's format; requires a page to be scanned twice to save text and graphics.

Requires: SE with 68020 accelerator card, or SE/30 or later with 4 megabytes of RAM (5 megabytes under MultiFinder). System 4.2 or later.

List Price: $795.

Caere Corp., 100 Cooper Court, Los Gatos, CA 95030; (800) 535-7226.

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2400Maxfax	PMD-13MF	9600	2400	•		•	•	Internal PC/XT/AT Bus	$349
2400BFAX	PMD-13FAX	9600	2400	•		•		Internal PC/XT/AT Bus	$199
2400PS	PMD-25FAX	4800	2400	•		•		Internal Micro Channel* Bus	$249
2400T	PMD-17FAX	4800	2400	•		•		Internal Toshiba Laptop	$249
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2400Minifax	PMD-7MFAX	9600	2400	•	•	•		Macintosh Plus or later	$299
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We're giving away thousands of dollars worth of Macintosh-related products, thanks to you, our subscribers. Our "Great Mac Portable Giveaway" was a huge success at the April San Franscisco Mac Expo. Here is a listing of the products donated and the winners, respectively.

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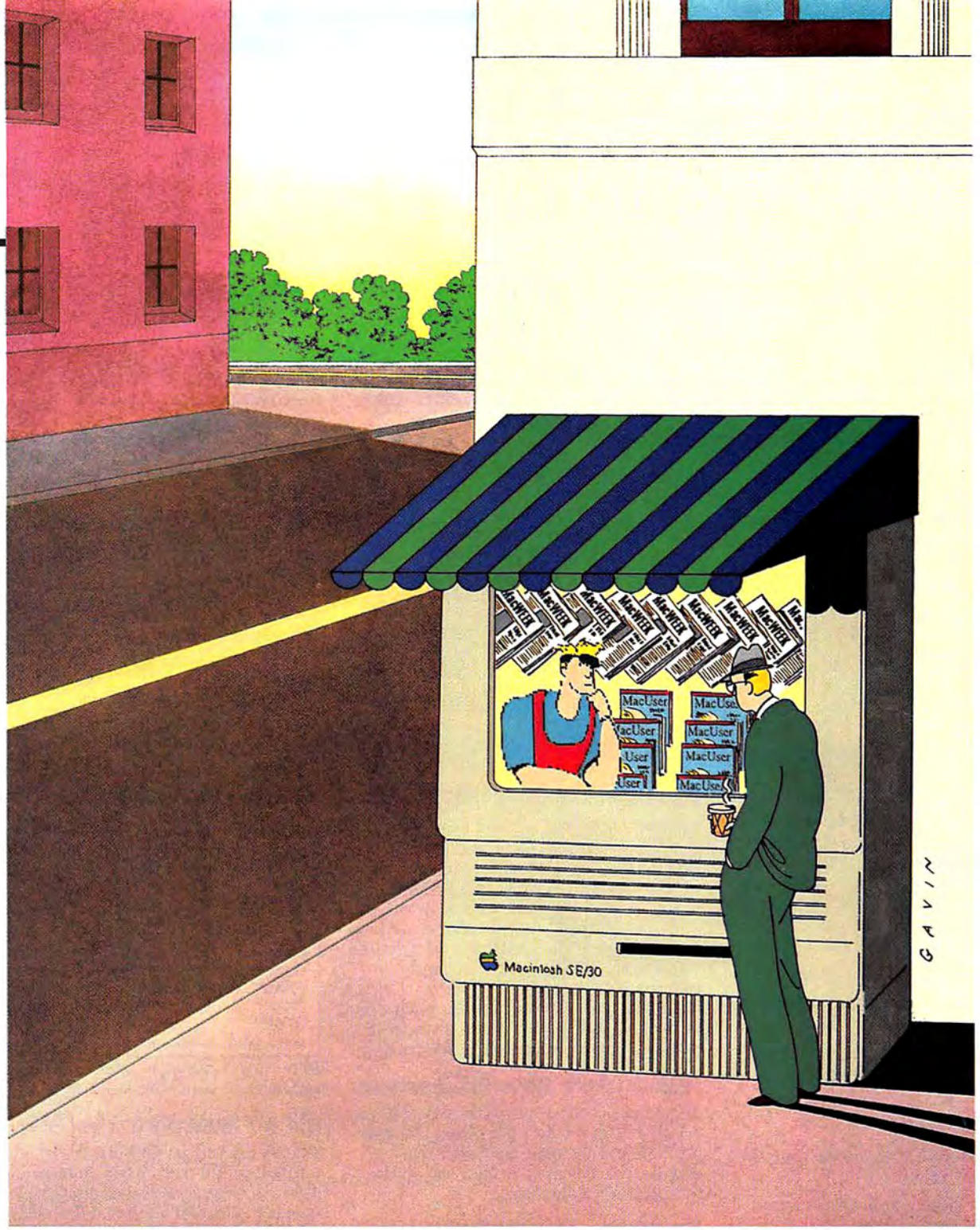
If you can't wait for your issues of* MacUser *and* MacWEEK *to wend their way through the mail, you can call up product reviews and download software from Zmac, our new on-line service.

Mr. Harley is an MIS director for a Fortune 500 company. He uses Post-it notes to mark *MacUser* reviews of products he wants to purchase. He wishes the magazine had an index.

Ms. Wilde is a network manager who saves money for her company by using shareware. But the time it takes to scan networks and download files costs the company money too.

Mr. Marlon is on his way to becoming a power user, but he still makes a lot of calls to busy tech-support reps. When he accesses an on-line service to ask a question, he usually gets more attitude than answers.

Like more than half of all *MacUser* readers, these people have turned to an electronic service to solve their problems. Now they can get answers to their questions about this magazine from Zmac, a *MacUser/MacWEEK* supplement on CompuServe. Zmac (the Z stands for Ziff Communications, our parent company) comprises four services: the Buyer's Guide, listing all MiniFinders reviews; the Download Library of shareware and freeware; the Tech



By Ben Templin

ILLUSTRATION: KERRY GAVIN

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"Editors And Customers Love It!

The technology behind our RM42 is the first that editors unanimously rallied around. Editors, concerned about reliability, torture tested the cartridges (one even survived an accidental flight of stairs). Our RM42 delivers infinite storage on 42Mb cartridges, and it does it faster than most hard drives (20ms).

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"If I could choose from all three manufacturers . . . I'd prefer the Mirror" –MacUser

Customers are using our RM42 removable drives everywhere and for everything:

- Publishers in New York are organizing projects by cartridge
- Designers in Sioux Falls are archiving entire clip art libraries
- Many of our customers are backing up data for the very first time with our RM42!

"Your [RM42] appears to be better built . . . and most importantly, it was quiet. Even better was your service. You have a product and personnel to be proud of."
–Judge E.R. Wedoff, Chicago, IL

We Repair The Competition's Drives



. . . and we've seen them all (Apple, Jasmine, SuperMac, GCC, PCPC, Ehman, and others). We've learned a lot about how (and how not) to build a hard drive. Most companies don't employ ESD static protection, pre-testing of sub assemblies, or utilize gold plated contacts. We do. So rest easy, your precious data is in good hands.

Factory Direct Saves You Hundreds

It's because of our direct strategy that we can deliver all this product and service at a great price. We eliminate the confusion and expense of middlemen. It's just you and us – the folks who build them.

Downtime . . . Practically Eliminated

You're not buying bookends. These are mechanical devices that spin at 3600 RPM for their entire life. That's why we created MirrorLoan, an overnight program that speeds a loaner to you. It's just one of the essential services you shouldn't be without.

We Hand Test Each M Series Drive

Size (Mb)	Int.	Ext.
20	$267	$347
30	317	397
40MP*	417	497
45	367	447
60	—	547
80	—	597
80MP*	667	747
105MP*	717	797
200MP*	1117	1197
290MP*	—	1997
580MP*	—	2497

* MP designates premium drive

While most companies sample test, we test every drive so the drive *you* receive is hand tested. It arrives pre-formatted, and loaded with 10Mb of software. Inside are the best and fastest components available (Quantum, Imprimis, Seagate), an international power supply, SCSI switching, fan, and cables.

Our #1 Removable: The RM42

Here's what you get for $697: Proven Syquest technology, full steel chassis, international power supply, convenience outlet, SCSI selection, RFI/EMI filtering, ultra-quiet fan, gold plated contacts, and all necessary cables. And it's backed with the longest supported warranty in the industry. It's everything you'd expect from a $1,500 removable for $697.

Remember, order today, it's on your desk tomorrow."



RM20 Removable Drive



150Mb Tape Backup



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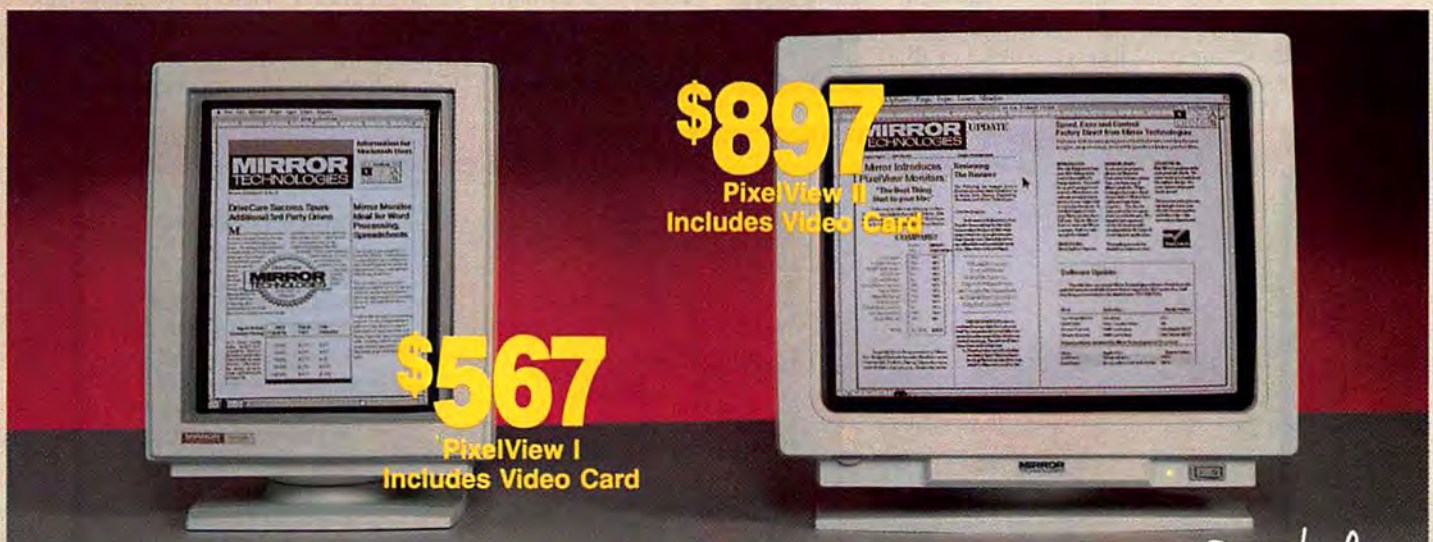


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VS300 Flatbed Scanner

PixelView II Display Removable Drive



"I want you to test drive one for 30 days: Love it or Return it!"

Ronald Eibensteiner, President/CEO

"It Took Time To Build A $1,700 Display System For $897

We sourced tubes from the same folks as Apple. We chose the same phosphor. We tuned the system to 78hz vertical refresh rate to eliminate annoying flicker. And we built in enhancements like pop-up menus, sizable cursor and menu bar, screen saver, screen copy and more! With all this for $897, what'll you do with the $800 difference? (hint: check out our RM42)

From Plus To Portable; We've Got You Covered

We have a PixelView I and II system for every Macintosh being made: Mac Plus, SE, SE30, Mac II, IIx, IIcx, IIci, IIfx, and portable. Each PixelView system comes with *everything you need:* monitor, card, cables, manual, and software!

COMPARE!

19" Monitor	Radius	Mirror
Anti-glare	yes	**yes**
Both screens active	yes	**yes**
WYSIWYG	yes	**yes**
78hz vertical refresh rate	no	**yes**
Tear-off/Pop-up menus	yes	**yes**
Cursor sizing	yes	**yes**
Menu sizing	yes	**yes**
Screen saver	yes	**yes**
Screen copy*	no	**yes**
Full year warranty	yes	**yes**
Dealer Markup	yes	**no**
Street Price	$1,695	**$897**

(Best Street Price 4/1/90) *Mac II, SE/30

I Used To Think That Large Screens Were A Luxury. Now I Can't Live Without One.

Until now, large screen displays cost more than the computer (and yet even at those high prices, I found them to be the top productivity tool on my Macintosh). PixelView delivers *that same productivity,* but at prices anyone can afford.

Take One For A Test Spin (but don't say I didn't warn you)

Take my modem. Take my (gulp) hard drive, but leave me my monitor. I feel that strongly and believe you will too. Don't go another week squinting and scrolling — here's my personal guarantee to you — try either Pixelview for 30 days. If it isn't exactly what you expected, I want it back. Period. ❞

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004

Support database for answers to common software questions; and the MacUser Forum, which allows readers to chat with *MacUser* editors. In addition, Zmac gives users access to the Computer Library, an index of all Ziff Communications publications, including *MacUser* and *MacWEEK*.



Zmac Run

Zmac is a natural, logical extension of *MacUser*. In each issue, we have more to say than we have space to print. For every product we review, there are two others we can mention only briefly. For every lab-report chart we print, four are left out. These limits don't affect an on-line service — CompuServe is like one huge hard

Figure 1: The Hierarchical Levels of Zmac

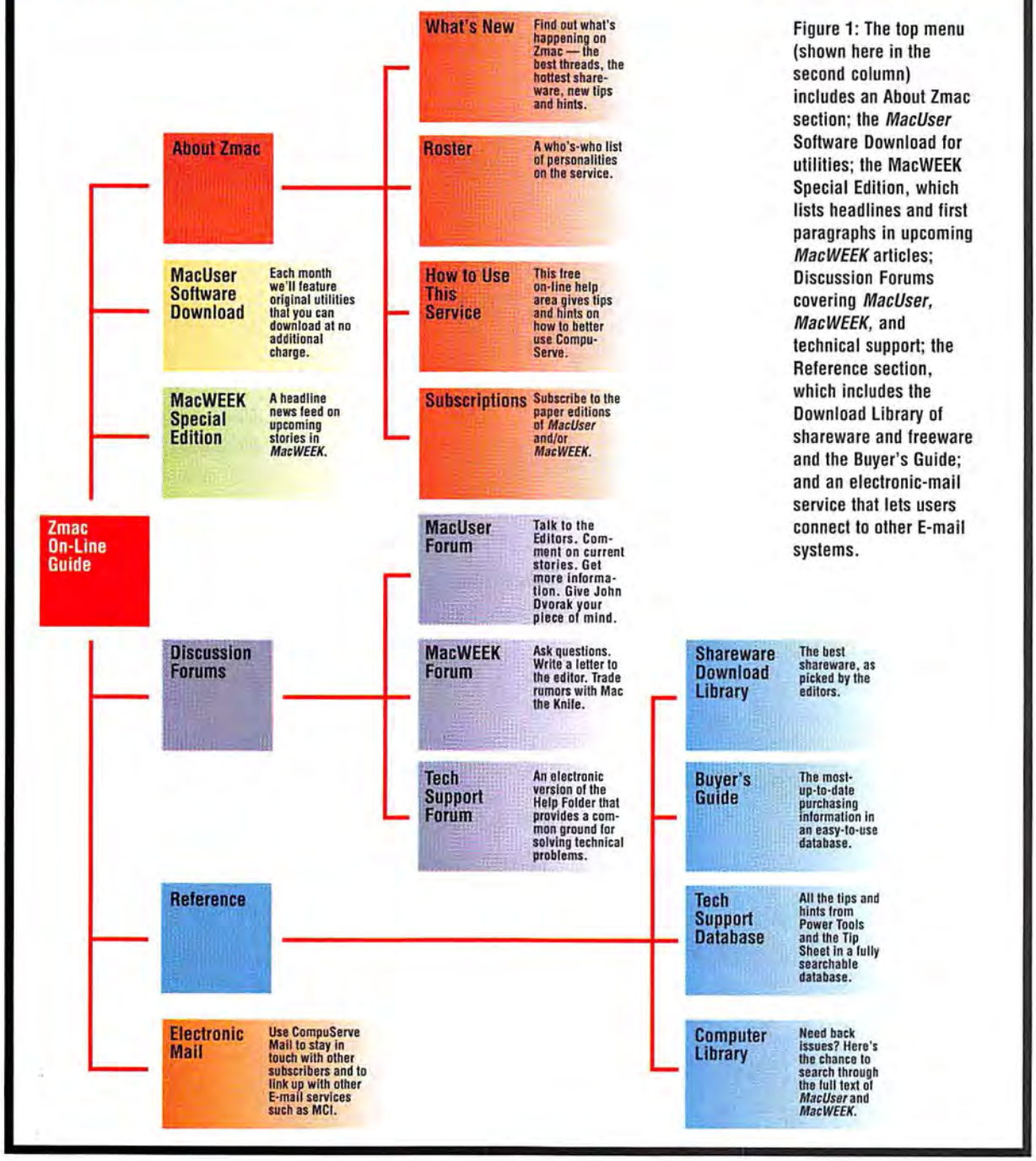


Figure 1: The top menu (shown here in the second column) includes an About Zmac section; the *MacUser* Software Download for utilities; the MacWEEK Special Edition, which lists headlines and first paragraphs in upcoming *MacWEEK* articles; Discussion Forums covering *MacUser*, *MacWEEK*, and technical support; the Reference section, which includes the Download Library of shareware and freeware and the Buyer's Guide; and an electronic-mail service that lets users connect to other E-mail systems.

disk without a memory ceiling. We are packing Zmac with as much data as we have in the vaults — including five years' worth of issues, the best shareware, up-to-date buying information, and the all-time best tips and hints.



Power Buyers

Products move quickly in the Mac world, so making informed purchasing decisions is difficult. It's hard to stay afloat in the constant stream of new prices, updates, bug fixes, and fresh ideas. A lot of you griped when we changed the MiniFinders from a monthly to a quarterly format. That's why we're now offering the Zmac Buyer's Guide, which is updated weekly, on-line.

The Buyer's Guide database combines the familiar *MacUser* critiquing techniques with the latest product news from *MacWEEK*. We're starting with more than 1,000 products, covering the entire range of available software and hardware. Each review includes the latest ordering information and prices, as well as announcements about new versions.



Download for Less

The reason most people go on-line is to download shareware. But you have to wade through thousands of second-rate programs to discover the winners. Then when you do find something good, you must beware of viruses. To help alleviate this frustration, we developed Zmac's Download Library, which combines the best-known shareware and freeware, chosen by the editors of *MacUser*. We test all the shareware on the Library with Disinfectant to make sure that it's free of any known virus. If you're looking for solutions that aren't going to cost you too much, then you ought to check out the Zmac Download Library.

Some of you may have already run across a preliminary version of the Download Library: the MacUser Download Area on CompuServe delivered the source code discussed in Kurt Matthies and Thom Hogan's Power Programming column. Every column instructs readers how to access the code. The Download Area service will be absorbed into Zmac's Download Library, and more *MacUser* articles will include cross-references to Zmac in the future.

Zmac, the electronic extension of* MacUser, *is a Mac resource you won't want to be without.



What's Your On-Line?

How often have you called a firm's tech-support line, only to end up leaving a message on its voice mail? Users' problems with getting their questions answered are the whole reason that user groups have sprung into existence. Hints, tips, and Q&A account for a substantial portion of *MacUser* each month too. We've collected all that help info into a Tech Support database, and it's available any time.

Still need to talk with the company? Zmac has collected the answers to the questions most frequently asked on tech-support lines. Although the Tech Support database is in its infancy now, we expect it to grow as companies seek on-line support for their customers. If you can't find the answer to your question in the database, then you can always turn to the Discussion Forums.



Talking Back

If you have ever wanted to write a letter to the editor, here is your chance to do it without waiting three months for an answer. The Discussion Forum lets you post messages; engage in discussions; and even hold conferences in

How to Join Zmac

If you are a CompuServe user, just type `GO ZMAC` at any ! prompt. If you don't belong to CompuServe, you can sign up on-line by following these directions:

Find your local access number by setting your communications software for 300, 1,200, or 2,400 baud; 8 bits; one stop; no parity. Dial (800) 346-3247. When you're connected, press the Return key. At the Host Name prompt, type `PHONES`. Follow the instructions to locate the access number in your area. Hang up and dial that number. After you've been connected, press the Return key.

At the Host Name prompt, enter `CIS`.

At the User ID prompt, enter `177000,5200`.

At the Password prompt, enter `Z*MAC`.



When you get the Agreement Number prompt, enter `Z12D9007`.

Register your name, and enter your VISA, MasterCard, or American Express account number. By choosing Business Account Invoicing, you can choose to have your company billed directly. For more information on both types of registration, call (800) 848-8199.

Your User ID and Password will be displayed at the end of sign-up. You can now dial CompuServe again to access Zmac. A new password will arrive in the mail within ten days.

If you need to speak with a person, call CompuServe Customer Service at (800) 848-8199. Once you're on-line, you're going to want to explore the various services we offer on Zmac. Use the map provided in Figure 1 to navigate.

Do you have to avoid embarr

The great technology lottery. You play it every time you buy computer products. Will your investment today make you look brilliant or foolish when tomorrow comes?



MacIRMA WorkStation software and MacIRMA hardware provide DFT coax connections for the Macintosh™ SE, SE/30 and NuBus architectures.

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or LocalTalk. And reliable, lower cost PCs or PS/2®s are used as gateways.

Since the same workstation software is used, there's a consistent user interface from standalone to LAN use, which results in reduced installation and training time. Also, MacIRMA API applications developed for coax work in the LAN gateway environment, so you walk away from none of your investment.

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real time with *MacUser* editors, columnists, writers, and other readers. Here is where we expect to answer your questions that are not covered in the Buyer's Guide or Tech Support databases.

The MacUser Forum is split into sections just like the magazine — StartUp, Lab Reports, Solutions, and the NetWorkShop. We've assembled a dynamic team of sysops to monitor the forums. Steven Bobker, known for Bobker's Dozen, is the chief sysop, with overall responsibility to keep things moving. The contributing editor of Tip Sheet, Greg Wasson, will monitor the Tech Support area.

Now you can write a letter to the editor without waiting three months for an answer.



Get Back Issues

Readers have consistently asked for an index of *MacUser* articles. (Some readers have gone so far as to create homemade indexes.) Zmac links up with the Computer Library, another Ziff service, to index every issue of *MacUser* and *MacWEEK*, plus a host of other computer-related publications. You can search multiple fields on the full text of all Ziff publications. With that power comes an extra price, though. On top of the normal CompuServe fee of $12.80 per hour, you have to pay $24 an hour to get on-line, plus a per-article charge of $2.50. That can be more expensive than a 900 number on a lonely Saturday night. In the coming months, *MacUser* articles will tell you how to cut down on your rates and get the most out of the Computer Library so you don't max out your piastic.



Log On Now

Zmac isn't going to replace *MacUser*. But it'll make reading *MacUser* easier. Not only can you locate the information more easily, but you get to talk back and make your views known.

Ben Templin is the on-line manager for *MacUser* and *MacWEEK*. He has been through three jobs since mid-1988, when he worked on the preliminary design for what was to become Zmac.

Window Dressing for a DOS-like Interface

Why did we choose CIS (CompuServe) as our on-line ally? It wasn't because of the interface. The command-line prompts characteristic of CIS are enough to scare away even determined Macintosh users. America On-Line and Connect have much cleaner and more Mac-like front ends than does CIS. When we surveyed our readers to find out which on-line service they used most frequently, however, it turned out to be CompuServe.

CompuServe knows that its interface needs help and is working to produce the CIM (CompuServe Information Manager), a graphical front end to CIS. To make Zmac more accessible, particularly for first-time CompuServe users, we've licensed a special version of CIM to distribute to Zmac users.

CIM navigates easily through the maze of CIS hierarchical menus. Navigation palettes, pop-up menus, and identifiers let you point and click to go to a new level. Without CIM, you must answer DOS-like prompts to navigate CIS. CIM also makes downloading files from CompuServe easier. It supports Quick-B, the fastest transfer protocol for CIS, for multiple files. CIM lets you view the history of a message thread (on-line discussion) as a tree chart, making it easier to read threads.

At press time, CIM was still in beta, with an expected release this summer. When it's available, we'll provide you with the Zmac version of CIM at a nominal fee — just enough to cover postage, handling, and our development costs. We also plan to support the other fine interfaces to CompuServe, such as MicroPhone II, Navigator, Smartcom II, White Knight, and other telecom-software packages. We'll let you know in the pages of *MacUser* when CIM ships. Or you can just log on to Zmac for an instant update. We'll be doing our best to make Zmac a CIS service that even Macophiles can love.

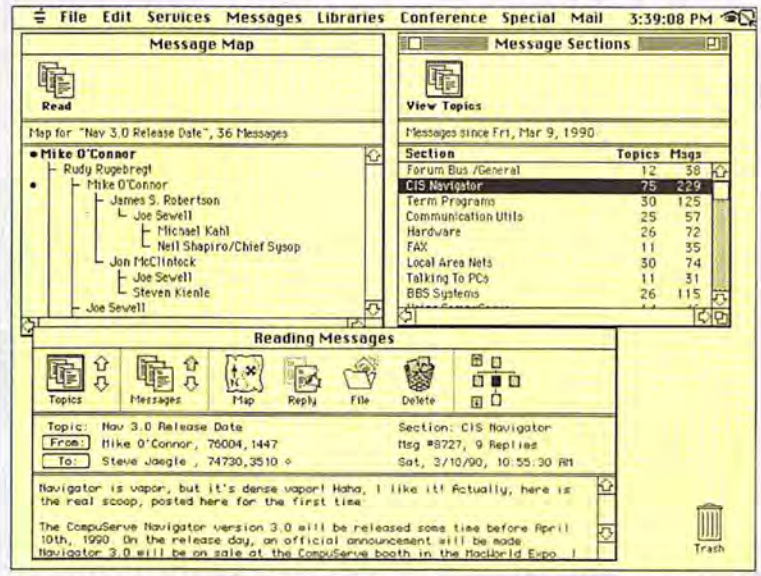


Figure A: Instead of using the ! prompts familiar to thousands of CIS users, CIM (CompuServe Information Manager) presents the structure of a forum in a series of windows. The upper right window lets you choose a section within a forum — in this case, the CIS Navigator section in the Mac Communications Forum. The upper left window maps out a message thread according to author. The bottom window contains the message that is currently being read.

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A MacWarehouse Memory Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable, overnight service will have your Kit in your hands tomorrow!

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Never again will you have to quit your word processor just to answer a question about a spread-sheet. Install extra memory and you can leave your letter open while you refer to last month's sales figures. You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

PLUG IN INSTALLATION

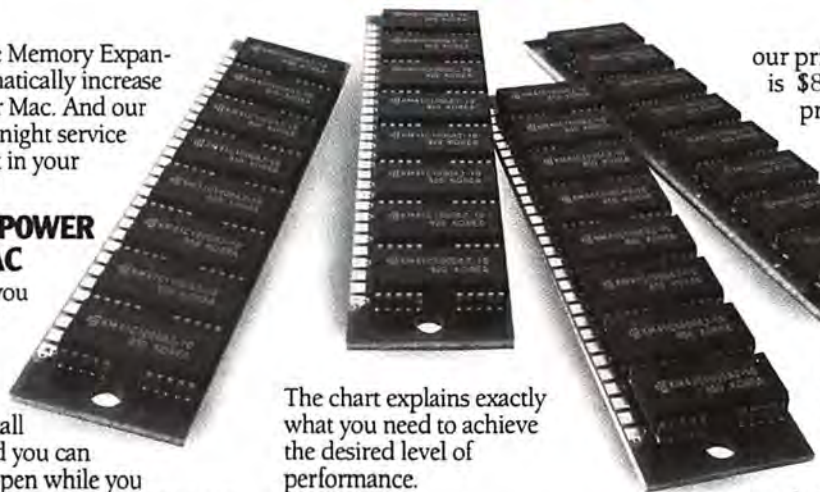
Adding memory doesn't require technicians in lab coats. Just open your Mac, slide out the main circuit board and plug in your SIMMs. Our FREE video will give you STEP-BY-STEP installation instructions. Every type of Mac is covered and we think we've made it a breeze.



WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs — (2@$85each).





The chart explains exactly what you need to achieve the desired level of performance.

To upgrade a 4-socket Mac Plus or SE to this amount of memory	Do this: (install in multiples of two only)
2 MB	Remove all four existing 256K SIMMs, install two 1M SIMMs, leave two sockets for future expansion.
2½ MB	Remove only two 256K SIMMs, install two 1M SIMMs.
4 MB	Replace all four 256K SIMMs with four 1M SIMMs.
To upgrade an 8-socket Mac II, IIx, IIcx, or SE30 to this amount of memory	**Do this: (install in multiples of four only)**
4 MB	Remove all four existing 256K SIMMs, install four 1M SIMMs, leave remaining sockets for future expansion.
5 MB	Keep existing 256K SIMMs, install four 1M SIMMs in remaining sockets.
8 MB	Remove all four 256K SIMMs install eight 1M SIMMs.

To open your Mac Plus or SE, you'll need a specially designed tool – it's available from us as part of a handy tool kit for just $9.

WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMS (Single In-line Memory Modules). Each one megabyte SIMM card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products.

Prices can vary a lot, based on quality, speed and demand. At press time our price for 1MB, 100 ns is $85 Please call for the very latest prices and availability. Our sales staff will tell you what you need and help make your choice an easy one.

SPEED

Do you need 70, 80 or 100 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor needs 120 ns (or faster) chip, and the 68030 Macs like the speedier model.

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If You Can Find A Better Deal In Hard Drives . . .

Between now and **June 30th**, MacWarehouse is offering savings on every hard drive we sell. So, if you're thinking of buying a new hard drive, your timing couldn't be better. Check out our sale prices and your savings, compared to our December 1989 prices, in the chart.

We offer drives by leading manufacturers like Cutting Edge, C.M.S., Quantum, Power User, PLI Infinity Turbo and others — all at unheard of low prices.

	20+ MB		30+ MB		40+ MB		60+ MB		80+ MB		***40+ Removable	
	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE
Cutting Edge	339	$100	379	$120	435	$114	469	$160	529	$210	699	$200
CMS, MacStack	429	$100	499	$46	589	$36	649	$50	769	$30	839	$36
Power User	319	NEW	359	NEW	399	NEW	459	NEW	499	NEW	659	NEW
PLI, Infinity Turbo	–	–	569	$20	619	**$26	–	–	–	–	999	$120
*Quantum Internal	–	–	–	–	399	$126	–	–	649	$220	–	–

Savings are calculated from MacWarehouse December 1989 published prices. *Quantum drives are for internal installation and require a 3.5 Internal Drive Kit for $75 **PLI is a 50meg turbo drive. ***40+ meg Removable Cartridge Drives come with 1 cartridge. Additional cartridges available.

Let our helpful sales staff take the hassle out of buying a drive. They'll tell you which drive



mechanism each manufacturer uses. They'll also tell you about access speed, reliability, software and the manufacturer's warranty.

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MacWarehouse sale prices, based on capacity, are shown in the chart. Also shown are the savings from pre-holiday prices. (This is a limited time offer, valid through **June** 30, 1990.) Overnight delivery is just $3, anywhere in the Continental United States.

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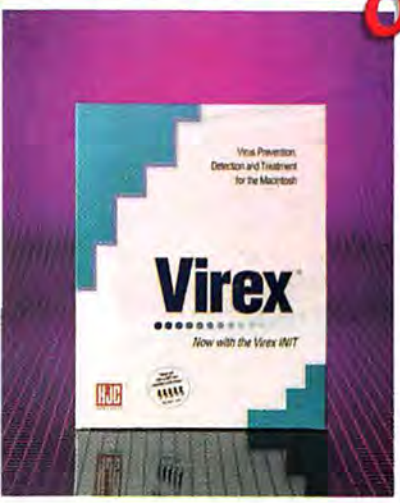
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(See details below)

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Virex 2.2 (HJC/Microcom)
Immunize your Mac against deadly computer viruses! Just give the command and Virex with The Virex INIT is on duty monitoring your Mac to prevent infection from all known Mac viruses. Use Virex's Record/Scan feature to identify previously unknown viruses. Once diagnosed, order Virex to operate and repair files like a skilled surgeon. Rapid upgrades stop new virus strains in their tracks. Registered users receive update notices and have access to publisher's Toll-free Virex Help Hotline. (security) **$52.**

Inside Information (Microlytics)
Consider your Thesaurus *extinct!* Inside Information is the next Evolutionary step in language organization for the electronic age. This essential desk accessory contains over 65,000 words logically organized in a hierarchical dictionary containing seven general word classes broken down into respective sub classes, categories and subcategories. Access information by scrolling through, clicking and expanding on topics organized in four logical formats. Perfect for research writing or boning up on topical "Buzz" words for presentations. (desk accessories). **$69.**



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370 ci UPS 315.
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Avery Labels (full line available) .. Call
Basic Needs, Inc.
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HardTop ImageWriter Covers 17.
Keyboard Flip 6.
Dust Covers - Grey Nylon Ripstop
Mac Plus and keyboard 11.
Mac SE & extd. or reg. keyboard 11.
Mac II and extd. keyboard 12.
Mac IIcx/ci Monitor Stand 40.
Universal Laser Printer Stand 28.
Utility Pac 11.
Curtis
Computer Tool Kit (52 pc.) 49.
Disk Holder (holds 40) 9.
Ergotron
MacTilt-SE 68.
MacTilt II-RGB 75.
ICD
Graflex 84.

I/O Designs
Imageware II Carrying Case 49.
Macinware IIcx Carrying Case 85.
Macinware Mac II Carrying Case 99.
Macinware Plus Carrying Case 64.
Macinware SE Carrying Case 75.
Monitorware Apple RGB Case 79.
The Ultimate SE Carrying Case 79.
Kensington
Anti-Glare Filter 33.
Apple Security System 34.
LaserWriter II Security System 32.

UnMouse (Microtouch)
The UnMouse does everything a mouse can - only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface. To make a selection, merely press down. The UnMouse also serves as an extended keyboard. Tap the large red button and you have a Power Keypad with 16 keys instantly available to execute macros (60 in advanced mode). With its one million touch points the UnMouse also performs as a small graphics tablet. Requires a Mac with ADB port. (input/output) **$.**



Mac II Stand w/Cable Kit 64.
MasterPiece Mac II 105.
PowerBacker 360 UPS Line 269.
PowerBacker 800 UPS Line 749.
PowerBacker 1200 UPS Line 949.
System Saver 63.
Mobius Products
Fanny Mac QT 55.
SE Silencer 39.
Polaroid
Circular Polarizing Filter 35.
Targus, Ltd.
Deluxe Plus/SE-XKB Case (black) 69.
ImageWriter II Case (black) 45.
Mac Plus/SE Case (black) 55.
IIcx /IIci Case 75.

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Layered, Inc.
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Full Mac line available in black. Some styles available in blue, burgundy, and platinum. Premium line now available.

DigiVideo (Aapps)
Get a window on the world from your Mac II desktop! View real time TV and video from a window in your Mac screen. Use the graphic displays in the window to adjust contrast and audio volume while accessing up to 98 cable channels. Monitor output from camcorders, VCR's, etc. Then grab frames to copy & paste into any Mac document including Hypercard stacks. Perfect for monitoring security cameras or running training tapes. (hardware) **$415.**



FREE!

If you found the first two versions of the popular Power User's Tool Kit useful, you'll be delighted to know that the very latest version, 3.0, is now available.

The new edition includes BOOMERANG 2.0, an ingenious utility, which makes it much easier to use the SF Dialog (the dialog box that appears when you choose Open or Save from the file menu).

You'll also find the latest version of DISINFECTANT (anti-viral freeware) and REMEMBER?, a handy reminder of the day's events when you start up your Mac.

The POWER USER'S TOOL KIT 3.0 is FREE from MacWAREHOUSE when you order from us. If you want the disk, you pay only $1.50 for shipping and handling. The programs are shareware, so you can try them free of charge. If you wish to continue using them, some authors ask that you pay a fee ($10-$35). Many of the programs are absolutely FREE. All of the details are explained on the disk, which is yours to keep.





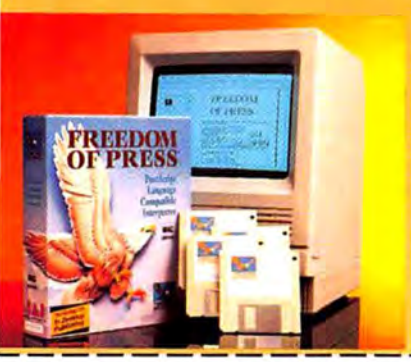


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Need urgent disaster relief? Before you summon the National Guard call up SUM II. SUM II (Symantec Utilities for the Mac) includes a variety of essential hard disk utilities to keep your Mac on track. Just pick the appropriate utility from SUM II's menu and the program does all the rest. Employ any number of powerful functions from data backup, recovery, and encryption, to hard disk optimization and tools to diagnose and repair files. (utility) **$99.**



Freedom of Press 2.1a (Custom Applications, Inc.)
Print PostScript language files using more than 50 different printers and film recorders. In combination with your favorite desktop publishing, graphics, drawing, painting and word processing software, Freedom of Press allows you to print PostScript language files, including support for 24 bit continuous tone color images. Complete with 35 scalable and rotatable outline fonts and drivers for all supported printers. Requires Macintosh SE30, II, IIcx, IIx or IIci. (utility) **$259.**

StuffIt Deluxe (Aladdin Systems, Inc.)
StuffIt Deluxe is the newest generation of the industry-standard compression, encryption, and archiving application. An easy-to-use interface and one-step QuickStuff/QuickUnStuff features allow beginners to benefit immediately. With over 75 new features, it employs many new state-of-the-art compression (including file-specific optimizers) and new security methods. Multiple archives can be opened and manipulated in a Finder-like fashion (with sorting, copying, renaming, or deleting). ViewIt brand viewers, a complete HyperTalk-like scripting language, and IBM-PC support (with dearc and unzip) are included. (utility) **$63.**



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Because you don't get a second chance to make a first impression. This powerful forms management system quickly creates, customizes, and prints professional quality custom business forms. Import and export data into user defined fields to perform automatic calculations. (business) **$89.**



White Knight 1.1
Successor to the legendary Red Ryder. New features list is more than 20 pages long! The 270+ pg. manual has plenty of tips to help beginners communicate like the pros. Comes bundled with Okyto, a revolutionary Mac-to-Mac file transfer program. Free subscription to GEnie network provided. (communications) **$.**



QuadLYNX Trackball
Uses Honeywell aerospace technology to give precise fingertip control over cursor movement. This device offers much greater precision in cursor placement. Just spin the trackball and the cursor flies across the screen to where you want it. Great for desktop publishing, CAD/CAM, graphics and arcade games. (input) **$59.**



Publish-It! Easy
Combines the sophistication of Publish It! with 10 Desktop Publishing firsts, and an easier-than-ever User Interface. Newcomers to Desktop Publishing can produce powerful documents everytime. Includes, word processor, 112,000 word spell checker, 240,000 word thesaurus, advanced page layout, drawing and painting tools. (desktop publishing) **$112.**

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Smart Alarms (9 - 15 users) 199.
Smart Alarms (16-25 users) 299.
Microlytics
Inside Information 69.
Preferred Publishers
DAtabase 1.5 68.
Vantage 1.5 52.
Solutions
SmartScrap & The Clipper 2.0 45.
Vision Software
Form Layout 35.

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PageMaker 4.0 or PrePrint 499.
Data Translation
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FastLabel 2.0 (Vertical Solutions)
Stick it to the chore of simple label printing in three easy steps! Import addresses, lists and graphics then use FastLabel's preformatted templates (or create your own) to produce everything from disk, V.C.R. and cassette labels to name badges, signs and more. (business) **$89.**
FastEnvelope
This handy DA lets you import lists and graphics to print eye-catching envelopes, then adds postal bar codes saving you time and money on bulk mailings. (business) **$50.**





Personal Press (Silicon Beach)
Personal Press creates professional layouts for you. Forget the long, steep learning curve, because Personal Press has AutoCreate to assemble stories and graphics into templates. It includes a full-featured word processor with spelling checker and thesaurus, controls for scanned images, spot color separations, posted notes, link navigator, extensive page previewing, and on-line help.
(desktop publishing) **$199.**

Letraset
ColorStudio 579.
FontStudio 459.
ImageStudio or Ready,Set,Go! 275.
Olduvai
Read-It! 2.1 (OCR) 278.
Read-It! Personal 2.0 139.
Read-It! TS (ThunderScan) 79.
Quark
QuarkStyle 169.
Xpress 469.
Silicon Beach
Personal Press 199.
Spinnaker/Springboard
PLUS 115.
Springboard Publisher II 109.
TimeWorks
Publish-It! Easy 112.

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MacStack 45 Meg 599.
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MacStack 44 Meg Removable 839.
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SyQuest Removable 45 Meg 699.
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Under the Mac 30+ Meg 379.
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Under the Mac 60+ Meg 469.
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Dayna Communications
Dayna File Single 360K (5 1/4") 525.
Dayna File Dual 360K & 1.44M 749.
Fujitsu
800K Disk Drive 159.
Kennect Technology
Drive 2.4 329.
Rapport 199.
Peripheral Land, Inc.
Infinity Dual Turbo 1875.
Infinity Turbo 40 Meg 998.
Turbo Floppy 1.4 359.
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80 Meg Drive 499.
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Quantum 40 MB Raw Drive 465.
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RasterOps
RasterOps Colorboard 264 760.

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Talking Tiles 26.
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Daily Double Horse Racing 19.
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The "ULTIMATE" SE Carrying Case (I/O Design, Inc.)
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Calendar Creator 38.
FastForms! 89.
Letter Writer Plus 53.
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Direct Mail 54.
ProPlus
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Softstream International
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DiskFit 1.5 (SuperMac)
A handy utility for backing up your hard disk on a series of floppies. It saves time because it backs up only those files which have changed since the last backup. DiskFit can verify each floppy after copying files onto it, so you know that your files are safe. DiskFit also discards old versions of files so your backup set doesn't keep growing. Version 1.5 supports a variety of cartridge tape drives, including the Apple tape backup system. (utilities) **$58.**

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Fits neatly under your Mac and provides up to 20 minutes of clean power. Built-in rechargeable battery prevents data loss and equipment damage. Protects against surges, spikes and power line noise. (accessory) **$219.**
Power Chute
Upon power failure Power Chute alerts all network users and initiates a graceful shutdown of the AppleShare Network. Communicates with a signalling American Power Conversion UPS (such as the 110SE or 370ci). (utility) **$67.**
370 ci UPS
Power protection for the Mac II family. With the 370ci Uninterruptible Power Supply, you'll have enough backup power to operate your Mac II system for 15 minutes. That includes a typical Mac II with a color monitor and an internal hard disk drive. (accessory) **$315.**



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FreeSoft
White Knight 11.0 85.
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Carbon Copy Mac 119.
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Power Packed Palette! Jammed with features, Easy Color Paint delivers thrills and excitment to any would-be Piccaso within mouse-reach of your Mac. Includes 17 tools, 256 colors, user defined patterns, multiple color palettes, coloring modes and much more. (graphics) **$45.**



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CanOpener 1.1
Information retrieval utility for the Mac. Search anywhere, and retrieve just about anything; including text, pictures and sounds. Locates text inside pictures, and gives you the whole picture! Anything you retrieve with CanOpener can be stored in its library, so the next time you need it, it's just a click away. (utility) **$64.**

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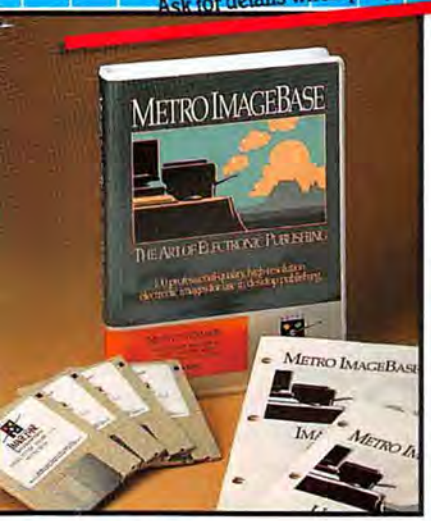


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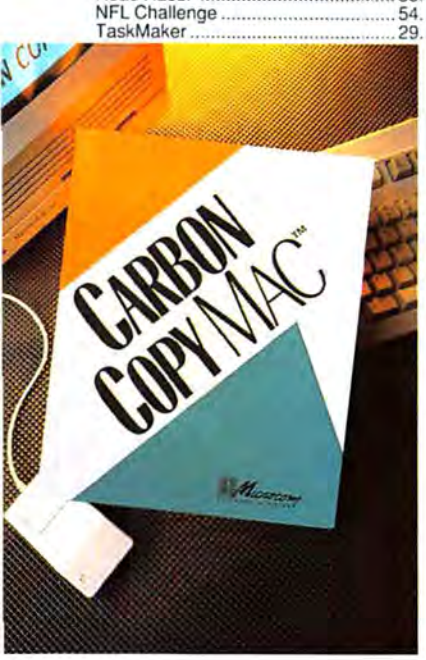
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Adobe
Adobe Type Manager 1.2 55.
Adobe Type Reunion 39.
Plus Pack 109.
TypeAlign 59.
Type Set 1 or Type Set 2 ea. 58.
Fonts (full line avail.) Call.
Altsys
Fontastic Plus 2.02 52.
Fontographer 3.05 249.
Metamorphosis 149.
The Art Importer 2.0 89.
Letraset
LetraStudio 275.
LetraFonts (various) ea. 69.
Tactic Software
ArtFonts Vol.1, 2 or 3 ea. 55.

Digital Vision
Computer Eyes B&W 199.
Computer Eyes Pro Color 349.
Dream Maker
Cliptures, Business Images 69.
MacGallery 27.
Electronic Arts
Studio/1 96.
Studio/8 295.
Studio/32 Call.
Graphsoft
Blueprint 219.
Innovative Data Design
Dreams 325.
Letraset
Shapes Call.
MacroMind
MacroMind Director 439.
Metro ImageBase (Full Line Available)
Art Deco or ReportMaker ea. 85.
Newsletter Maker or Business ea. 85.
Mindscape
ZING 125.
Multi Ad Services
Multi-Ad Creator 865.
ProArt: Bus., Sports or Holidays ...ea.95.
Paracomp
Swivel 3D 1.1 295.

ResumExpert (A Lasting Impression)
Whether you're seeking an entry-level position or an executive's corner office, the ResumExpert Software Series is the next best thing to knowing the boss. Professionally written and fully-formatted Microsoft Word templates let you easily create eye-catching resumes. MacUser 10/89 awarded ResumExpert 4 mice and raved about the "excellent manual" that includes expert writing tips. MacUser 12/89 rated it as one of the Top 200 Software Programs of 1989. See line listings for all 10 editions. (business) **$39. each**



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Streamline 229.
Aldus
Freehand 2.0 329.
Aperture Technology
Aperture Visual Information Mgr. 729.
Broderbund
Drawing Table 79.
TypeStyler 119.
Claris
MacDraw II 289.
MacPaint 2.0 93.
Creative Software
Easy Color Paint 45.
Deneba
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Ultra Paint 125.

Carbon Copy Mac (Microcom)
Run the office from your easy chair! This remote control software package that allows one Mac to remotely operate another Mac's peripherals, screen, keyboard and mouse. Works through LocalTalk LANS or modems. Transfer files without using EMAIL, access messages remotely, or "borrow" expensive peripherals such as CD-ROM drives and fax modems. Unparalleled tool for training demonstrations. Offers three levels of password security. Get a second node FREE through manufacturer's Special Introductory Offer. (communications) **$119.**

Silicon Beach
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Super 3D 2.0 339.
SuperPaint 2.0 125.
SoftStream
Relational Objex 150.
Somak
LaserArt CD-ROM #1 or #2 59.
Strata
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Map Maker 4.0 295.
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HardTops for keyboards
You'll flip your lid over these durable covers! Protect keyboards from unexpected spills and falling objects with impact-resistant ABS plastic. By Basic Needs. Platinum color. (accessories) Starting at **$15.**



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PixelPaint 2.0 225.
PixelPaint Professional 389.
Tactic Software
Art Clips Vol. 1 or Vol. 2 Call.
Zedcor
DeskPaint & DeskDraw 115.

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General Computing Company
WriteMove Ink Jet Printer 575.
Magnavox
Color Monitor 14" 535.
Microtek
Microtek MSF-300GS Scanner 1589.
Microtek MSF-300Z Scanner 1998.

NEC
Intersect CDR-35 419.
Qume
Crystal Print Publisher 2900.
Seikosha America
Seikosha Printer (dot-matrix) 235.
Sharp
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ThunderWare
LightningScan 400 385.
ThunderScan Plus 199.

HYPERWARE

Bantam
Complete HyperCard Handbook 22.
Beacon Technologies
HyperBible International Version 175.
HyperBible King James Version 145.
Bright Star Technology
HyperAnimator 1.5.1 98.
interFACE 229.
DataDesk International
HyperDialer 29.
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SuperCard 1.5 189.
Softstream International
HyperHit 125.
Symmetry
HyperDA 1.2 45.
TimeWorks
HyperWorks Organizer 57.

INPUT/OUTPUT

Altra
Felix 127.
Calcomp
WIZ Tablet 159.
WIZ Pen 57.
WIZ Templates ea. 33.



DeskWorks (Zedcor)
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CH Products
Mach IV Plus Mouse/Joystick 49.
Mirage Adaptor 35.
Roller Mouse ADB 75.
DataDesk Intl.
DataDesk Switchboard 175.
Mac 101 Keyboards 129.
International versions Call.
Kensington
New Turbo Mouse 109.
Kraft
ADB Joystick Premium III (SE&II) 49.
QuickStick 39.
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WealthBuilder (Reality Technologies)
Turn your Mac into your own financial planner. Taking into account your financial profile, the goals that you want to accomplish and the risk that you are willing to assume, WealthBuilder searches for the best investments available to fulfill your objectives. The program also allows you to change any information or assumption and immediately view its impact on your overall financial picture. Wealthbuilder is your personal tool to a brighter financial future. (finance) **$165.**

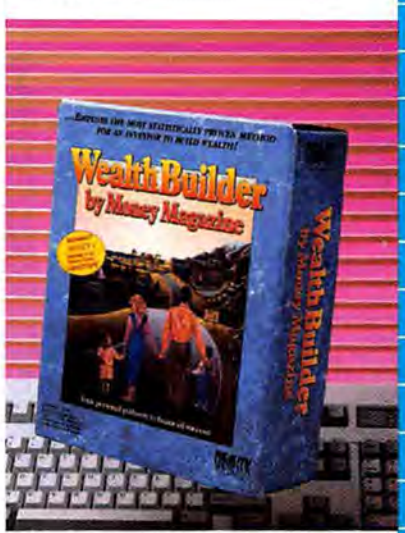


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Now you can connect your Macintosh to your existing business or home telephone for automatic dialing with Apple's HyperCard. HyperDialer is designed specifically for HyperCard's touch-tone dialing capabilities and works with-line business phones without requiring a modem or dedicated phone line for automatic dialing. Automatically dials HyperCard, SideKick, Focal Point, C.A.T., SuperCard and QuickDex phone numbers. It connects to the speaker port - not a precious serial port. (hyperware) **$35.**

LYNX
QuadLYNX Trackball 59.
Micro Touch
The UnMouse 189.
Mobius
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Mouse Systems
A+ Mouse (SE/II) 75.
Practical Solutions
The Cordless Mouse 95.
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Symantec
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THINK'S Lightspeed Pascal 168.
Zedcor
ZBasic 5.0 89.





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MacGolf Classic (XOR Corp.)
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Hayes
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Smartmodem 9600 (V series) 759.
Prometheus
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ProModem 2400 SE Int. 209.
ProModem 2400M 199.
ProModem 2400M II 205.
Travel Modem 205.
Supra
Supra Modem 2400 129.

MUSIC AND SOUND

Altech
MIDI Interface 59.
ARS Nova
Practica Musica 2.2 69.
Coda
Finale 569.
MacDrums 31.
Perceive 49.

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There's no more need to be a super sleuth in order to find and view elusive files - with On Location it's elementary! Find a file by typing words it contains or any part of its name. Then instantly view the file with its original fonts and word-processing commands. Move copy, rename or delete files and more! ON Technology offers a manufacturer guarantee of full customer satisfaction or your money back up to one year from purchase date. (utility) **$75.**



Electronic Arts
Deluxe Music Construction 2.5 85.
Deluxe Recorder 99.
Farallon Computing
MacRecorder (records sound) 159.
Screen Recorder 125.
Passport Designs
NoteWriter 325.
Passport MIDI Interface 89.

SECURITY & VIRUS PROTECTION

ASD Software, Inc.
FileGuard Extend (office 5-pak) 309.
Fifth Generation
Disk Lock 106
HJC/Microcom
Virex 2.3 52.
Kent Marsh
MacSafe II 107.
NightWatch 86.
QuickLock 56.

SmartOne 2400 Modem (Best Data Systems)



For beginners and experienced modem users. If you need a 2400 baud modem, the SmartOne 2400 Modem provides an economical alternative. For less than the cost of some 1200 bps units, you get a Hayes compatible modem with auto answer/originate, 300, 1200 and 2400 baud operation, pass-through phone jack, speaker with programmable volume, and a manufacturer's two-year warranty. All user options are stored in non-volatile memory. Includes software and cable. (modems) **$145.**

Primera Software
Different Drummer 59.
Repertoire
Music Publisher 359.
Resonate
Listen 2.0 62.
Tactic Software
Sound Clips Vol. 1 or 2 ea. 49.

Mainstay
AntiToxin 59.
Symantec Corporation
S. A. M. 68.

SPELLING/DICTIONARY THESAURUS CHECKERS

Deneba Software
BigThesaurus 64.
Spelling Coach Pro 3.1 125.
Electronic Arts
Thunder II 49.
Lexpertise
MacProof 3.2.1 115.

Microlytics
Electronic Word Finder 59.
Word Finder 2.0 34.
Sensible Software
BookEnds or Sensible Grammar 53.

STATISTICAL ANALYSIS

Abacus Concepts
StatView II 279.
StatView SE+Graphics 199.
D2 Software
MacSpin 2.0 189.
Wolfram Research
Mathematica (SE) 450.

UTILITIES

Abbott Systems
CanOpener 1.1 64.
Affinity
Tempo II 99.
Aladdin Systems Inc.
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Let it Ride! You can bet on having hours of fun with Casino Master's five exciting casino games. Includes **Blackjack Ace, Crapsmaster, Roulette Master, Pokermaster** and **Baccarat Master**. Exact table simulation, mouse controlled betting, selectable bankroll, stored win/lose statistics and complete manual included. Mac II version available in full color! An odds-on favorite with professional gamblers. (entertainment) Individual games **$27. ea.** / 5 game Casino Master Package **$49.** / Deluxe Mac II version **$55.**

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Power Chute 67.
CE Software
DiskTop 4.0 or QuicKeys 1.2 ea. 64.
Caere
OmniPage 545.
Central Point Software
Copy II Mac 23.
Mac Tools Deluxe 75.
Custom Applications
Freedom of Press 2.1a 259.
Dantz Development
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Dayna Communications
DOS Mounter 55.
Fifth Generation
FastBack II 106.
PowerStation 2.5 33.
Pyro 22.
Suitcase II 43.
ICOM Simulations
On Cue 35.
Insight Development
MacPrint 95.
Magic Software
AutoSave II 29.
BackMatic 50.
POWERicons or POWERmenus ea. . 39.
Mainstay
Capture 2.0 49.
Microlytics
GOfer 45.
Olduvai
ClipShare 165.
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ON Technology
On Location 75.
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Norton Utilities for the Mac 75.
Preferred Publishers
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HandOff 32.
Somak
ScriptEdit 49.
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SuperMac
DiskFit 1.5 or SuperSpool 5.0 ea. 58.
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Symantec Corporation
SUM II 99.



InBox Plus 3.0 (TOPS)
Like regular InBox, InBox Plus is an electronic mail system for Macs and IBM PCs, but optimized for larger systems. InBox Plus supports up to 100 clients and provides a broader range of administrator tools for managing a larger network. It also offers advanced features, such as routers to other servers, and a higher level of security. (communications) **$649.**



DeltaGraph 1.5 (DeltaPoint)
Chart your road to success! This Eddy award winning program has everything you need to create professional looking charts for business and scientific presentations. Features 25 Chart types, overlays, Superscripts/Subscripts, CricketGraph file import and many other enhancements. Use the Data Notebook to import 10,000 points of spreadsheet data and DeltaGraph will create the chart you want. Then import EPS or PICT files or use any of DeltaGraph's extensive drawing tools to embellish your work. (business) **$99.**

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FontShare 2.0 149.
Icon-It 2.0 45.

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New Horizons Software
WordMaker 65.
T/Maker
WriteNow 2.0 119.
WordPerfect Corp.
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Get an edge on your competition-get a *Cutting Edge!* Available in 20MB to 80MB sizes, Cutting Edge hard disk drives deliver quiet, reliable memory power with access times as low as 20ns. Its push button external SCSI address switch and removable SCSI terminators allow easy daisy chaining of up to 7 SCSI devices. Need security and portability? The 45MB Removable employs industry standard SyQuest technology and provides unlimited storage through exchangable cartridges. (see line listings). (hardware). **20MB only $339, 30+MB only $379, 45+MB only $435, 60+MB only $469, 80+MB only $529. 45MB Removable: $699.**







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SOLUTIONS

Spreadsheets to Go: *Choosing a* SPREADSHEET

HOW TO FIND THE BEST SPREADSHEET PROGRAM — FAST

The Mac spreadsheet market has a life of its own. Each month, it continues its inexorable expansion as new products are released and older products are re-released, ready to vie for the attention of consumers and the lion's share of the market.

The differences among individual programs can often be subtle, but those subtleties can affect the quality of your work. A simple way to understand the spreadsheet market is to divide it into three levels: high-end, full-performance products — such as Excel, Full Impact, and Wingz — that include development environments; midrange systems such as Trapeze, RagTime, and Microsoft Works; and straightforward calculation tools such as MacCalc.

The market can be further broken down into functional segments: number crunching (or straight calculation), in which MacCalc is a contender; presentation, where Trapeze, Works, RagTime, Excel, Full Impact, and Wingz are the stars; and development, where Excel, Wingz, and Full Impact shine.

If you are buying your first spreadsheet program, don't be intimidated by the esoteric features of high-end products. These programs have a great deal of versatility; Excel and Wingz are proficient in all three functionality segments, and Full Impact lacks only sophisticated number-crunching tools. Spreadsheet programs are a classic one-time investment — once you learn how to use one, you'll be reluctant to change — so consider buying the most flexible program. In many cases, the price difference between a low- or midlevel program and a high-end spreadsheet program is less than $250, so the initial investment in a high-end product will ensure that you have plenty of room for growth.

Whether or not you know exactly which tier of the market and functionality level you want in a spreadsheet program, the diagrams that accompany this article should help you decide on the best spreadsheet program for you.

By Ken Landis



ILLUSTRATION KERRY GAVIN


NUMBER CRUNCHING
DEVELOPMENT

MacCalc ★★★★

MACCALC IS A LOW-END SPREADSHEET PROGRAM WITH GOOD DATA-ANALYSIS TOOLS.

Pros: Streamlined user interface. Models can be annotated at each construction step. Fonts, styles, and formatting are variable from cell to cell. Excel, MultiPlan, or Lotus 1-2-3 models can be converted into MacCalc format without losing their formats and models.
Cons: No integral graphics capability. Relies on Microsoft Charts for graphics.

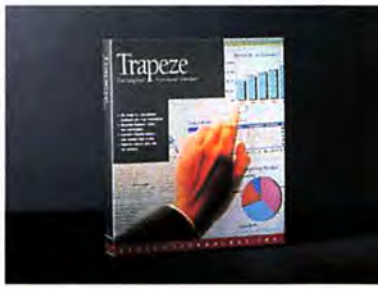


Requires: Mac 512K or later.
List Price: $139.
Bravo Technologies, P.O. Box 10078, Berkeley, CA 94709-0078; (415) 841-8552.

Trapeze 2.1 ★★½

TRAPEZE OFFERS THE POWER OF A SPREADSHEET PROGRAM WITH THE FLEXIBILITY OF A PAGE-LAYOUT PROGRAM.

Pros: Supports a 68880 math coprocessor. Calculates in the background under MultiFinder. Spreadsheets can be up to 1,600 pages long. Can open and link up to 32 spreadsheets. Wide variety of chart types (including scatter, bar line, stacked bar, high/low, column, stacked column, pie, and polar). Excellent control over graphics.
Cons: Page-layout orientation is difficult to learn and use. Nonstandard interface and approach make it dissimilar to other spreadsheet programs.
Requires: Mac Plus or later.
List Price: $295.
Deltapoint, 200 Heritage Harbor, Suite G, Monterey, CA 93940-2483; (408) 648-4000.



Presentations

High-function charting. High-function charting systems offer not only the basic business charts (line, pie, and bar) but also the option of putting legends onto the charts and of adding titles and other graphic touches that create presentation-quality output. Works falls out of the competition at this branch of the decision tree because of its limited charting function.

Mixed text and graphics. Combining graphic displays and text in columns is the key to creating powerful, professional presentations.

Desktop publishing. Advanced layout features that build on integrated text and graphics complete the presentation equation. Trapeze, RagTime, and Full Impact are easy to use to generate an entire presentation; Excel and Wingz, however, are tools for creating charts and graphs for inclusion in a presentation created in a page-layout program.

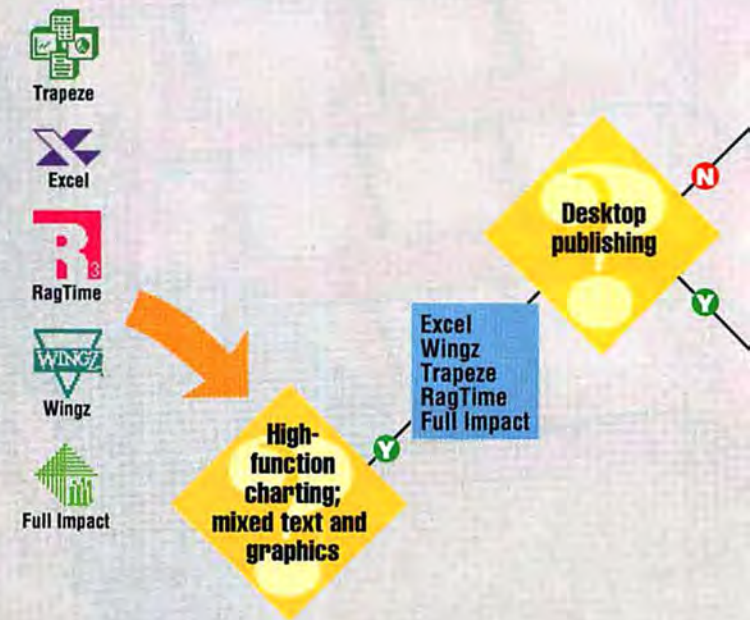
Conforms to standard interface. The spreadsheet market has developed a de facto set of interface standards. Trapeze does not conform to these, which gives the product a steep learning curve and limits its usefulness in business settings.

Free text on charts. The ability to put text onto a chart to explain the chart or results is important when creating presentations. For example, free text can be used on a sales line chart to describe any unusual changes.

Integral word processing and dictionary. When you prepare presentations, full word-processing functionality ensures maximum flexibility. Spell checking is also important — no one wants a chart to contain misspelled words.

Drawing tools. Freehand graphics on a chart can make the difference between mere information and a memorable chart. Wingz has firmly established itself as *the* spreadsheet program for creating sophisticated graphics rather than straightforward text presentation.

Use this decision tree to decide which spreadsheet offers the best presentation options for you.

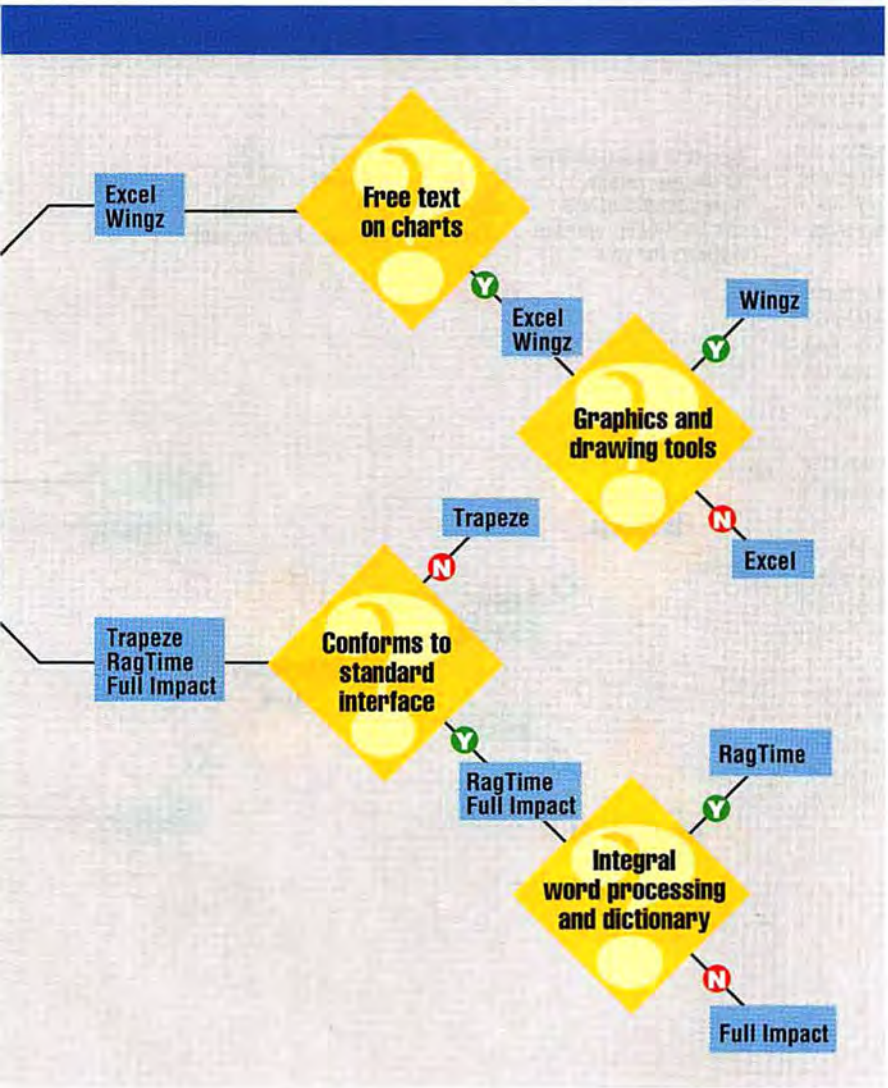


RagTime 3 ★★★★½

RAGTIME IS A MULTIUSE PRODUCT WITH WORD-PROCESSING AND PAGE-LAYOUT AS WELL AS SPREADSHEET CAPABILITIES.

Pros: A wide array of charts. Integral word processor with spelling checkers in 8 languages and hyphenation dictionaries in 14 languages. Linked spreadsheets within the same or other documents update automatically. Eighty functions. External functions can be added for importing data from SQL databases. Has desktop-publishing functions such as the ability to flow text around frames and to adjust color and tint.
Cons: Minimal number-crunching capabilities.
Requires: Mac Plus with hard-disk drive; 2 megabytes RAM recommended.
List Price: $599.
RagTime, 400 Walnut St., Suite 501, Redwood City, CA 94063; (415) 780-1800.





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Full Impact 1.1 ⭐⭐⭐⭐

FULL IMPACT IS A FULL-FEATURED, HIGH-END SPREADSHEET PROGRAM WITH IMPRESSIVE ABILITIES. VERSION 2.0 WAS RELEASED IN APRIL.

Pros: Global search and replace. Virtual memory. Integral linking capability within the program. Row heights adjustable in case fonts change or exceed the spreadsheet's borders. Excellent graphics and text integration as well as overlay and stacking features.



Cons: Lacks some statistical functions.
Requires: Mac Plus or later.
List Price: $295 (version 2.0).
Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502-1319; (800) 437-4329 or (213) 329-9989.

Microsoft Excel 2.2 ⭐⭐⭐⭐

A FULL-FEATURED, HIGH-END SPREADSHEET PACKAGE.

Pros: Global search and replace. Rows-into-columns transposition. Integral linking within the program. Ability to customize menus and create dialog and alert boxes. Strong statistical functions and matrix-math capabilities.
Cons: Graphics capabilities weaker than those of other packages. Recalculation is done in the background, with the application giving higher priority to user input. This suspends recalculation, which resumes when editing pauses.
Requires: Mac Plus or later.
List Price: $395.
Microsoft Corp., One Microsoft Way, Redmond, WA 98052-6399; (206) 882-8080.



Development

Macro or development language. A macro language uses mnemonic commands to control and automate spreadsheet functions; a development language is a structured programming language used for the same purposes. Excel uses straight macros for control; Full Impact uses a psuedolanguage called Full Talk; Wingz's HyperScript language controls even the internal mechanics and logic of the program.

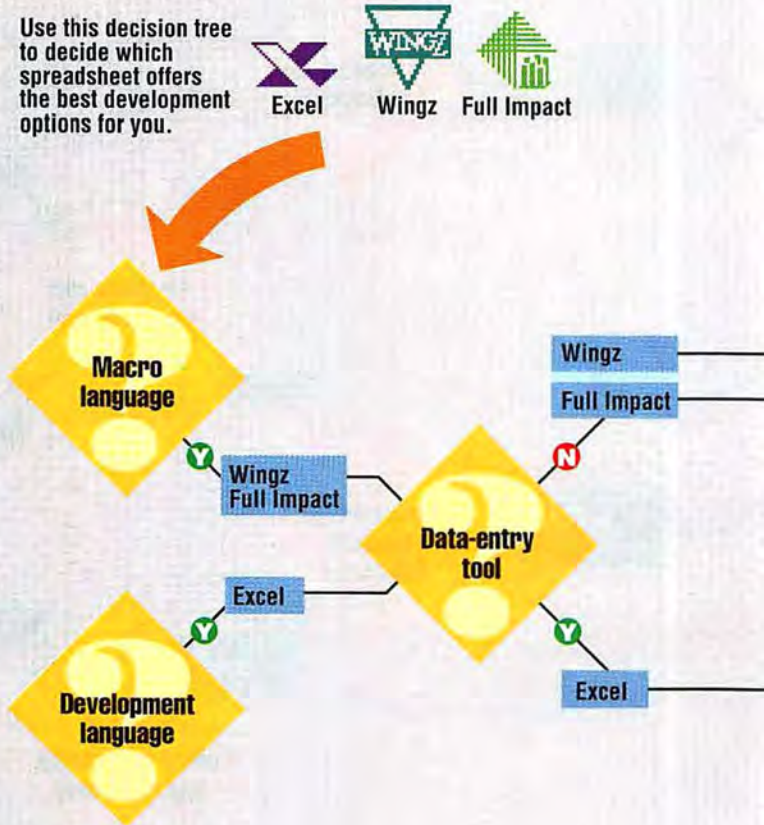
Data-entry tool. Creating customized data-entry forms and input is important for development. Wingz forces developers to create these tools from scratch, using HyperScript. Excel has built-in functionality that lets you quickly and easily create these data interfaces.

Integrated database. Manipulating data is a key part of any application. Excel and Full Impact have powerful data tools that can manage and analyze data stored in spreadsheets.

Dialog-box creation and screen control. Excel and Full Impact both offer tools for creating interactive dialog boxes. The screen control, which determines how the developed application flows, is roughly equal in both packages.

Interactive macro debugging. Excel offers an interactive macro debugger that makes debugging and quality-testing an application dramatically more efficient. Full Impact and Wingz do not offer this functionality — they wait until the macro crashes and then debug it.

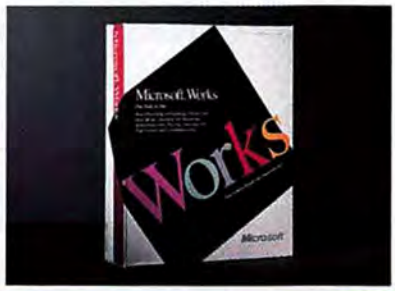
Use this decision tree to decide which spreadsheet offers the best development options for you.

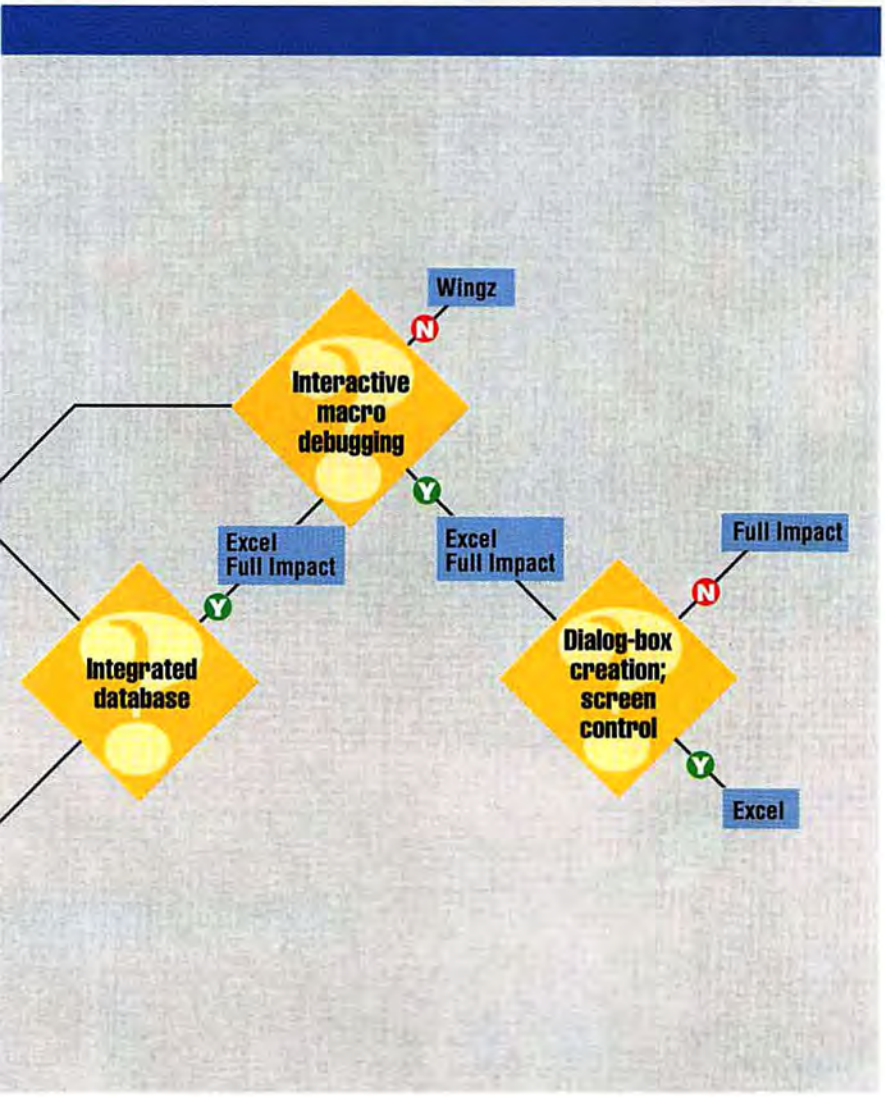


Microsoft Works 2.0 ⯪⯪⯪

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Pros: Large spreadsheets. Pie, line, bar, stacked, and combination charts. Charts automatically change with new data.
Cons: Sorting function only adequate. Offers little functionality.
Requires: Mac Plus or later.
List Price: $295.
Microsoft Corp., One Microsoft Way, Redmond, WA 98052-6399; (206) 882-8080.





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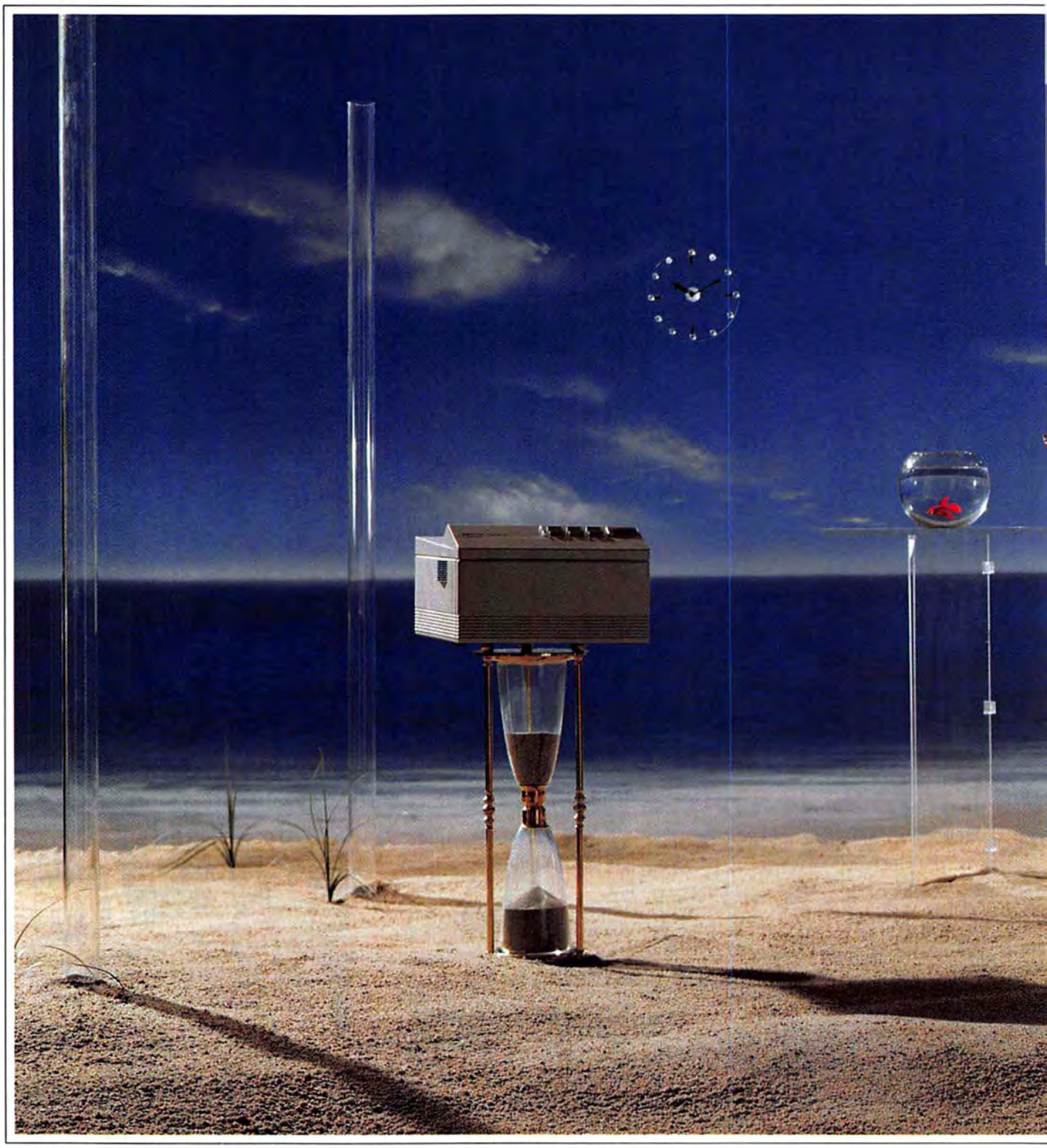
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WINGZ IS A SOPHISTICATED HIGH-END PRODUCT WITH EXCELLENT GRAPHICS THAT IS INFORMIX SOFTWARE'S FIRST FORAY INTO THE SPREADSHEET MARKET.

Pros: Offers remarkable 3-D graphics. HyperScript language lets you change menus, options, and functions by editing the master script file.
Cons: Requires a lot of custom macro programming to perform linking operations. Minimal recalculation technique can take longer than recalculating an entire spreadsheet.
Requires: Mac Plus or later.
List Price: $399.
Informix Software, 16011 College Blvd., Lenexa, KS 66129; (800) 331-1763.



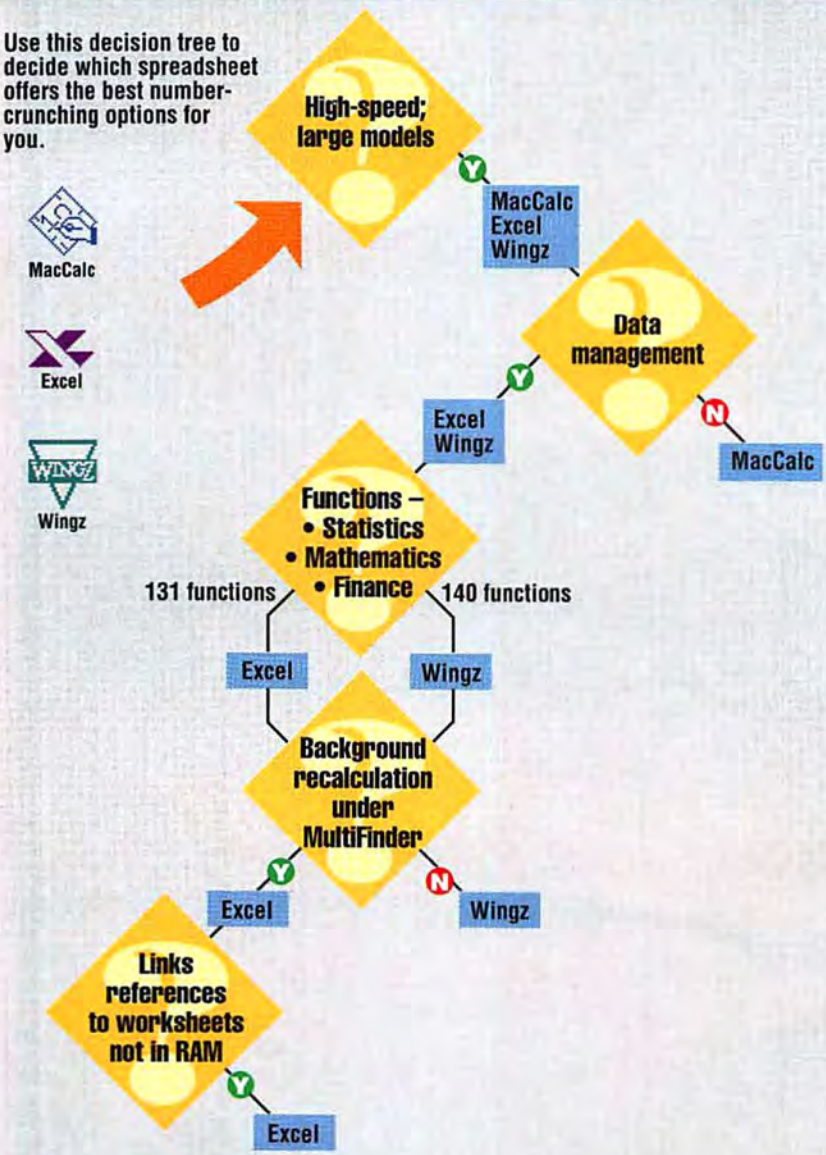
Number Crunching

Data management. Data management is the ability to manipulate rows in a spreadsheet, using straightforward techniques such as sorts, selects, and Boolean or logical expressions, as well as summary statistics such as minimum and maximum values and data counts. Excel and Wingz both offer an integrated database.

Functions. Built-in spreadsheet functions are formulas into which users can input variables. Functions return the results of calculations in cells, so you don't have to program common business formulas such as discounted cash flows, amortization, and regressions. Excel and Wingz are functionally identical for purposes such as these.

Background recalculation under MultiFinder. A critical requirement for any number-crunching spreadsheet program is the ability to perform true background calculations. Minimal recalculation, the method used to recalculate only those cells that are affected by a value change, is also important, but in data-intensive applications, even a high-speed minimal recalculation can slow down the user interface. Excel offers true background recalculation, whereas Wingz relies on minimal recalculation.

Use this decision tree to decide which spreadsheet offers the best number-crunching options for you.



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Hand Tools.

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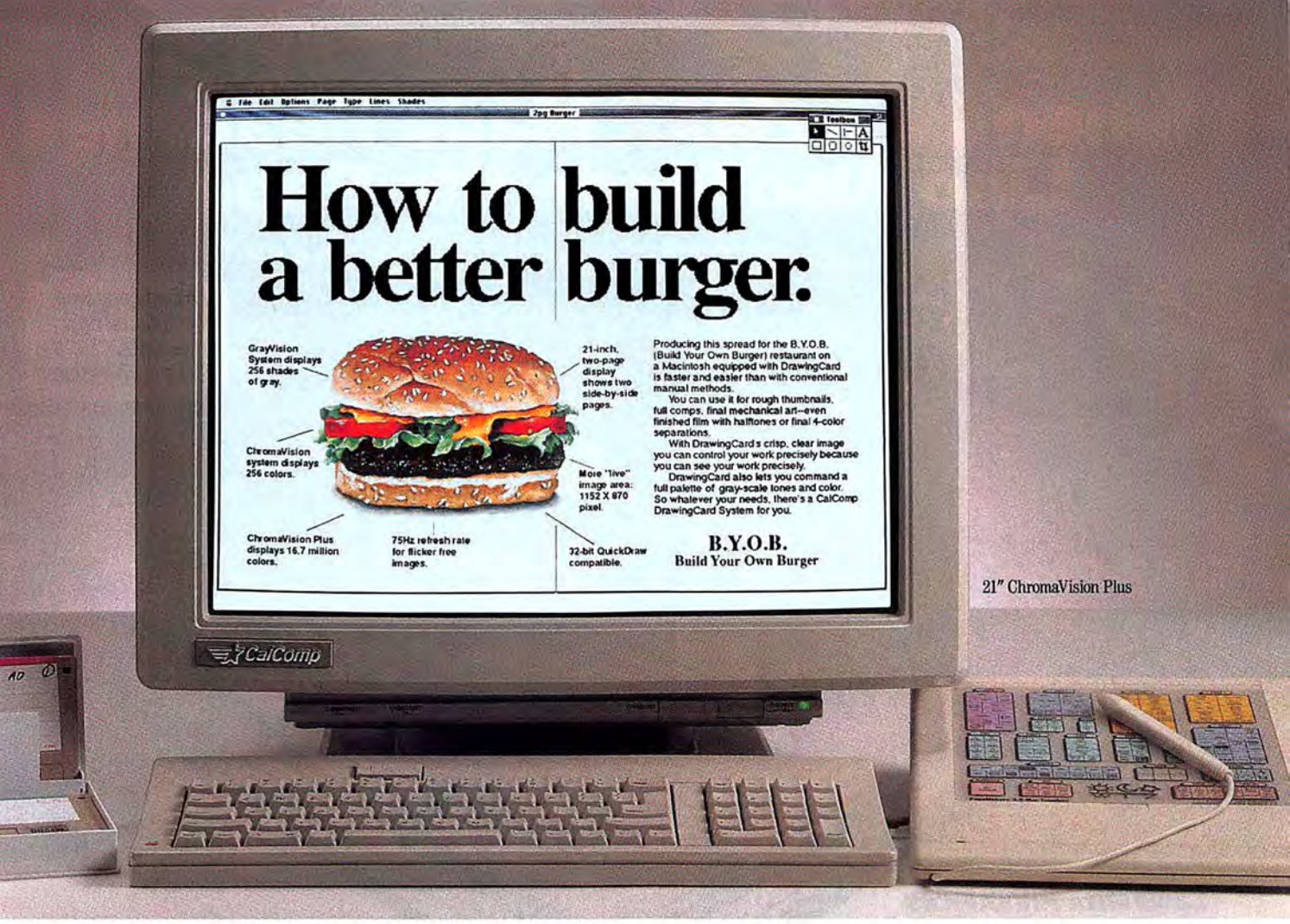
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And with DrawingCard displays, what you see on the screen is what you get on your printer because screen resolution is true 72 dpi.

All screen images were scanned, imported, displayed and photographed on CalComp DrawingCard displays.

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There are three DrawingCard systems to choose from. Our 8-bit GrayVision display system with 256 shades of gray is ideal for desktop publishing and design projects using line art and black-and-white halftones.

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And our 24-bit ChromaVision Plus system (shown above) with 16.7 million colors is the ultimate display where color accuracy is especially critical such as color retouching.

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Prepress: Cures for Poor Registration

Poor registration can ruin even your best color work. Here's how to trap those slippery problems.

A short quiz: Where do the terms *trapping*, *choking*, *knockout*, *butt fit*, *stripping*, and *spreading* come from?

A. The front page of a sleazy tabloid.

B. The nightly report from a vice-squad cop.

C. The holiday itinerary for a mountain man.

Answer: None of the above. These are actually traditional terms for some of the best-kept secrets in the four-color-prepress film industry. They refer to techniques that compensate for the mechanical inaccuracies of printing presses. These techniques dramatically affect the final appearance of printed color.

With the current technology, you can use a Macintosh and an image-setter to sidestep traditional prepress work and print pages directly to film. As the final product is still produced mechanically, however, you must continue to take steps to offset press-time imperfections. Although these compensation techniques are no longer trade secrets, they are still misunderstood.

Pass the Plate

Multiple-color printing uses several plates, each of which deposits a different colored ink onto the paper. If the plates aren't in proper alignment — if they're *misregistered* — as the paper passes through the press, the colors won't print in the correct locations. For example, a color may print slightly to one side of its intended position, causing the image edge to look fuzzy or show small margins of white where adjoining colored areas don't mate perfectly (see Figure 1). Some color shifting is normal in press runs, but this shift can be anywhere from less than a hairline to more than a couple of points, depending on the quality of the pressmanship and press.

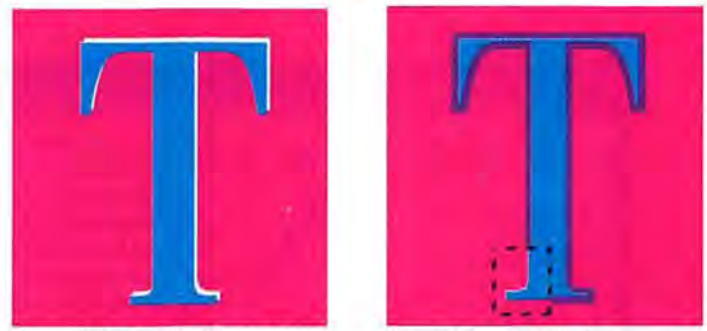
On a printing plate, a solid colored shape on, say, the cyan plate, typically has a hole reserved for it in all the other printing plates so that the other inks don't overlay it. This hole is called a *knockout*, and because each hole is exactly the same size and shape as the overlaying object, perfect *butt-fit* registration is necessary to avoid unsightly gaps at print time.

Trapping

Professional printers compensate for color misregistration by using two basic techniques that affect the boundaries of objects: *spreading*, or enlarging an object's edges, and *choking*, or shrinking the size of the hole that accommodates an object. The application of either of these techniques is commonly called *trapping*.

If you're a household mechanic, you know that the best way to create a perfect seal between mating components is to use a gasket or washer, which fills in the irregularities between adjoining parts. In the world of

Figure 1: Spreading the Word



Poor registration of printed colors reveals white space on one side of the letter and overlapping colors on the other. Printing presses can introduce such errors, which range from microscopic to glaringly obvious.

A spread compensates for misregistration by using a thick overprinting stroke to make the original shape slightly larger than its background hole. (The overlap is shown in purple.) Because thick strokes broaden fine typographical details, spreads work better for nontext objects. Compare the thickened letter with its original form inside the dotted frame.

By Steve McKinstry

desktop publishing, programs with PostScript technology (such as FreeHand and Illustrator) let you use the *stroke*, or outline, of an object as the electronic equivalent of a gasket to seal gaps between an object and its background. This is possible because PostScript lets you fill an object with one color and stroke it with another. More importantly, PostScript also lets you *overprint* the stroke and the fill separately, which gives you microscopic control over both the size of the elements printed by each plate and the corresponding holes left in the other plates. Overprinting a stroke compensates for misregistration by filling in potential white gaps with a thin border of the appropriate color. The techniques described below can also work with both Illustrator and FreeHand.

Inexpensive Spreads

A spread, which is a gasket applied to the border of an object, is simple to achieve and works well for nontext objects. In FreeHand or Illustrator, you can simply specify the spread size by adjusting the *weight*, or width, of an object's stroke (see Figure 1). The weight of the stroke is distributed half inside and half outside the object, so to create a .5-point spread, you would specify a 1-point stroke with the same color as that of the interior fill. (Normally, spreads are set at a range of .25 to .5 of a point.) If the object is placed on a colored background, set the stroke to overprint and the fill to *not* overprint. If the plate or paper does shift, the stroke will provide a .5-point margin of error, overprinting any white space that might otherwise appear between the shape and its background.

Arty Chokes

Trapping around type is best done with a choke, which is slightly more difficult to do but which better preserves letter shapes. Choking is like applying a gasket to the hole for the shape rather than to the shape itself. It effectively shrinks the hole and fills in potential gaps without affecting the type's form (see Figure 2).

If you were to use the spread technique instead, the stroke would be applied to the type and would undesirably increase the weight of serifs and other fine typographical details. It's better to shrink the hole and print the unstroked type over it.

PostScript lets you overprint the stroke and the fill separately, which gives you microscopic control over both the size of the elements printed by each plate and the corresponding holes left in the other plates.

To create a choke, don't give the original text block any stroke at all, and set its fill color to overprint. Make a copy of the text, give it a white fill, and apply a 1-point no-overprint stroke that's the same color as that of the background. When you stack this modified copy between the colored background and the original text, it produces a .5-point choke around every letter. (Incidentally, this choke process works equally well for any nontext object.)

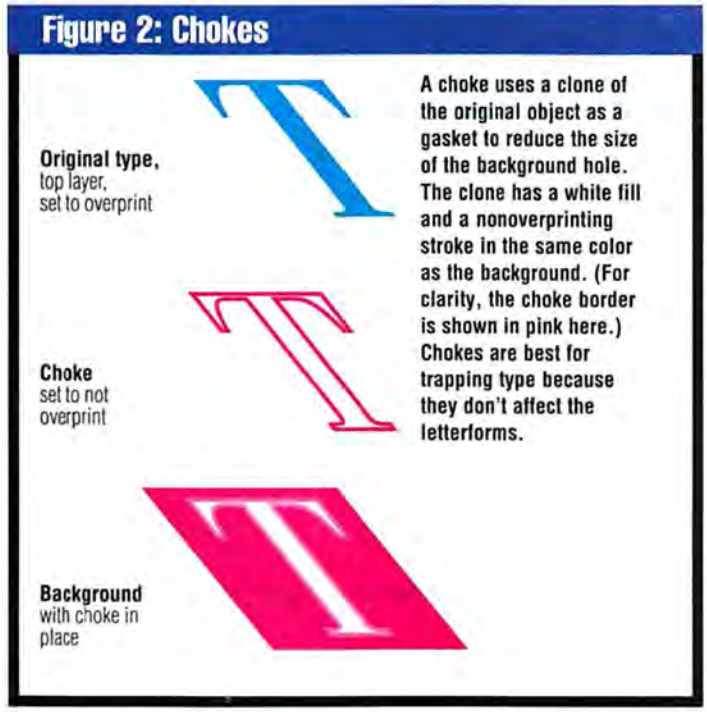
Text over Multiple Colors

Often you need to trap text over multiple background colors—for example, when the name of a country overlays several different-colored areas of a map. Because text is involved, you should use the choking technique, but each background color needs a gasket of its own hue (see Figure 3).

In FreeHand and Illustrator, you need to add *masking* to your trapping technique to ensure that each choke color affects only its corresponding background. Masking is essentially a fancy way to crop a graphic using any drawn outline as a frame. (Consult the appropriate user manual if you're not familiar with this feature.)

Create each choke from a copy of the original text block, and give it a 1-point, no-overprint stroke that matches the particular background color it floats over. Now you must trim each choke, via masking, so that it overlays only its corresponding background color. To mask each choke with the appropriate background shape in FreeHand, select a choke-text block and cut it (Command-X). Then select the corresponding background shape, and choose Paste Inside from the Edit menu. If you're using Illustrator, define the colored background shape as a mask, and group it with its correspondingly colored choke-text block. Finally, in either program, be sure that you bring the original text block to the front. Figure 3 shows the elements of this technique as well as their stacking order. You can check these traps on a light table by using

Figure 2: Chokes



A choke uses a clone of the original object as a gasket to reduce the size of the background hole. The clone has a white fill and a nonoverprinting stroke in the same color as the background. (For clarity, the choke border is shown in pink here.) Chokes are best for trapping type because they don't affect the letterforms.

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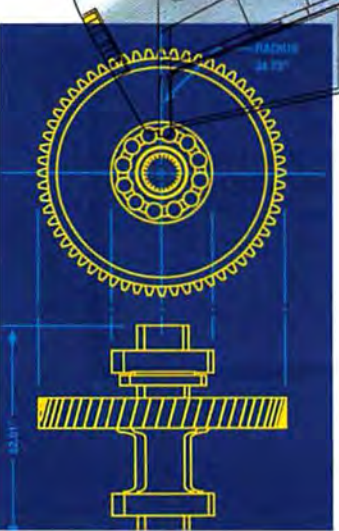
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separations printed on paper by a laser printer.

QuarkXPress correctly applies all the traps in imported FreeHand or Illustrator images that were saved in EPSF. PageMaker 3.02CE and PageMaker 4.0 will do likewise when their pages are separated through Adobe Separator or Aldus PrePrint.

Trapping with Frames

With a color photograph, the area most affected by misregistration is the border. You can cover up errors by applying a *keyline* — essentially a black gasket that surrounds the photo.

With a color photograph, the area most affected by misregistration is the border. You can cover up errors by applying a keyline — essentially a black gasket that surrounds the photo.

Ideally, you want the edges of the photograph to fall along the center of the keyline's width. On sophisticated prepress systems such as the Scitex, this can be an automatic function. When you use the Macintosh, it's usually a work-around solution.

In QuarkXPress version 2.12, you can frame pictures only with keylines that run either inside the picture border or outside it, depending on your Preferences settings. Centering the edges of a photo on the middle of the framing line requires two frames — one inside and one outside the picture's border. You assign frames with the Frame menu and dialog box.

If you want to get a 1-point keyline trap, you need a .5-point inner and outer frame. First you use the Preferences dialog box to set the measurement units to points, and set the Framing option to Inside. Next, you create a picture block and assign it a .5-point frame thickness. Then use Get Picture to place an image into the frame and position it as needed.

Duplicate the frame by selecting it with the hand/I-beam tool and using Step and Repeat. Specify .5-point for both the Horizontal and Vertical Offset values. Next, without changing tools, press the backspace key to delete the contents of the duplicate frame. Choose Modify from the Item menu to bring up the numerical data for the copy. Make this frame transparent and subtract 1 point from its Width and Height values, which shrinks and centers the new block perfectly inside the original.

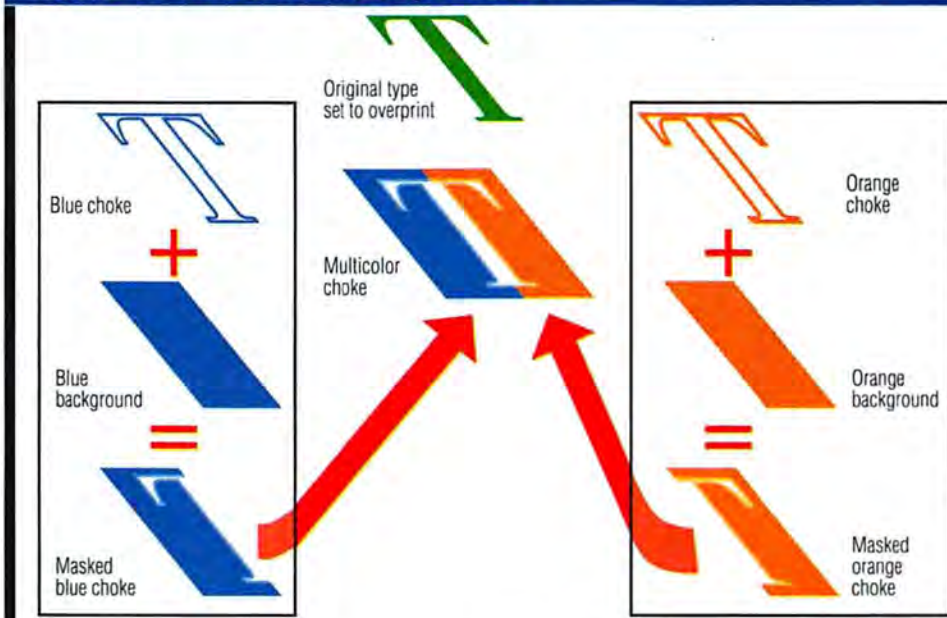
In PageMaker, you can create a keyline frame/trap with the rectangle tool, but you must do careful fitting by eye at the 400-percent view. Fortunately, you need only one rectangle per picture. As you maneuver the rectangle over the picture, you know you've achieved overlap when half the thickness of the dark line switches to a negative as it intersects the edge of the photograph.

Other Trappings

There's another way to create a keyline trap. With this method, you place a color photograph saved as EPSF into Illustrator or FreeHand and then carefully draw a no-fill and black-stroked rectangle around it, making sure that the lines of the rectangle straddle the edges of the picture.

With either FreeHand or Illustrator, you can also add type over the photograph and apply a spread to the text by giving it a thin stroke that is set to overprint and a fill that does not overprint. The photograph with added type and keyline can then be saved as EPSF and be placed in a page-layout program for separation.

Figure 3: Chokes over Multiple Colors



Chokes over multiple colors require a separate choke object for each background color. Each choke is masked by its corresponding background in order to trim off the excess outline. The masked chokes are then combined into a single unit over which the original type is printed. (For clarity, the choke borders are shown in lighter colors here.)

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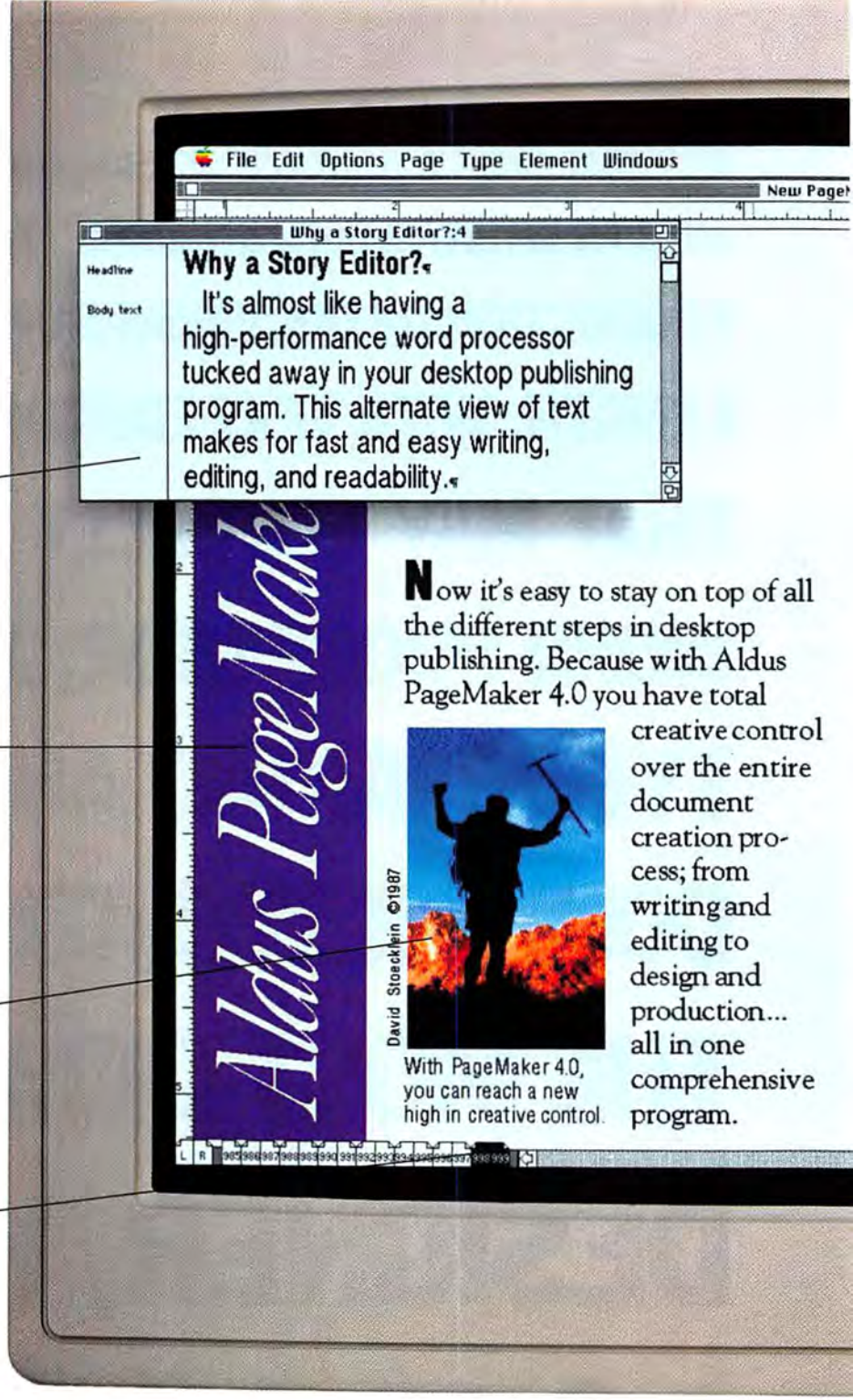
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Proof Positive

Always proof color images before they go to press — it can prevent rosy cheeks from turning into red faces.

Even before the advent of desktop color technology, the need to *proof*, or preview color images before going to press was always an essential part of the production process. A good color proof provides a reasonable facsimile of what your publication's colors will look like once the pages have rolled off the printing press. It helps you make aesthetic design decisions and serves as an early-warning system for catching problems. Proofs are particularly important for four-color work, because printing is usually the largest expense. If you have to make changes after a job is on the press, the cost can be staggering.

There are several options for generating a color proof; the choice depends on your specific needs. The quickest and cheapest way to proof a color image is to look at it on a color monitor. Unless you work with a carefully calibrated system, however, the monitor's colors won't accurately match what appears on paper. This may be adequate if all you need to know is whether a color is yellow or green, but it's completely useless if you need to be able to see and fine-tune subtle shades of color.

Beyond screen display, there are two basic categories of proofs (see Figure 1). Preseparation proofs, also called *digital proofs*, are fairly easy to generate by printing the computer image directly to a color printer or film recorder. Depending on the image and the output device, these proofs can be fairly accurate. However, they aren't as reliable as *film proofs*, which require that you output four-color film separations on a high-resolution imagesetter.

Digital Proofs

Recent advances in color technology have greatly expanded the options for printing full color directly from the Mac (see "Color on the Page," May '90 Buyer's Guide, page 56). Thermal-wax printers such as the QMS ColorScript 100 and Tektronix Phaser CPS can produce a very decent proof at 300 dpi. Although these devices are extremely useful for previewing color tints and type in page layouts and for proofing computer-generated artwork, you shouldn't use thermal-wax proofs to make critical color decisions. They also can't accurately render continuous-tone photographs. Thermal-wax proofs are relatively inexpensive, costing $1 to $5 per page at a service bureau. If your output volume makes it more practical to buy a thermal-wax printer, the QMS and Tektronix models — both of which handle PostScript and provide good color quality — will set you back around $10,000.

If PostScript compatibility isn't an issue, you can proof color on a broad range of QuickDraw devices. Inkjet printers such as Hewlett-Packard's PaintJet ($1,395) and the Tektronix ColorQuick ($2,345) are considerably less expensive than thermal-wax printers, so you can probably afford an in-house unit for instant proofing gratification. Inkjet printers also print at a much lower resolution

Figure 1: Proofing Options



Digital proofs (output directly from computer)

Currently available

- Thermal-wax printers
- Inkjet printers
- Film recorders
- Video printers

Best used for comps and layout. Extremely inaccurate for continuous-tone images.

Future availability

- Sublimal-dye printers
- High-end inkjet printers
- Color laser printers

May someday be reliable enough to produce accurate previews of final color without the expense of creating film separations.



Film proofs (require film separations)

Currently available

- Color key (overlay)
- Match print (laminated)
- Cromalin (laminated)

Currently the only reliable methods for proofing color before going to press.

By Keith Baumann

XEROX

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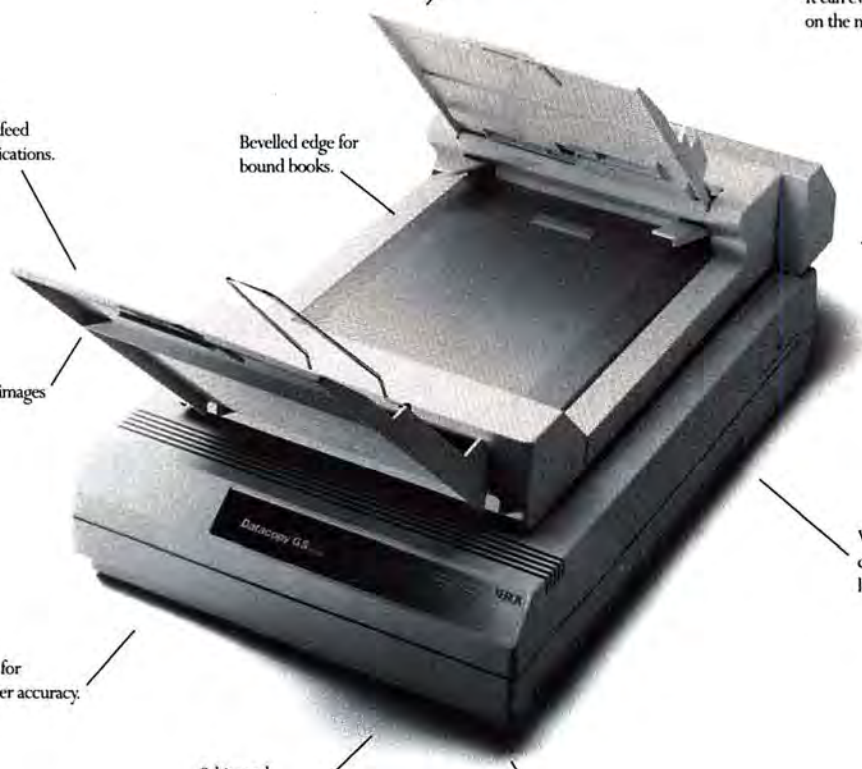
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(about 180 dpi), however, making them useful only for basic proofing of QuickDraw graphics. They are practically useless if you need to check text or images with subtle color gradations. Another inkjet printer, the Howtek Pixelmaster, offers 240-dpi resolution plus the ability to output PostScript through a software driver, but it's still barely adequate as a color-proofing device.

Although the color printers that currently interface with the Mac are inadequate by prepress standards, the future holds some promising technologies for preseparation proofing. Superlative output from the Iris 3024 and other high-end inkjet printers has been available to the prepress industry for years at sky-high prices ($75,000 or so); the imminent addition of a Mac interface may bring these printers to your local service bureau. Sublimal-dye printers are an especially exciting technology. These machines vaporize CMYK inks, which blend with each other as they soak into the page; the resulting image resembles a continuous-tone photograph. The Mitsubishi S340-10 has already reached the market, and at $15,995, it may be within reach of some desktop publishers. The highly touted Kodak XL7700 ($25,000) and ultra-high-end Du Pont 4Cast printer ($75,000) provide sublimal-dye output that's almost indistinguishable from a photograph. Color laser printing may also be a reliable means of generating color proofs. Canon offers stunning color on its Color Laser Copier, and it too will soon sprout a Macintosh connection.

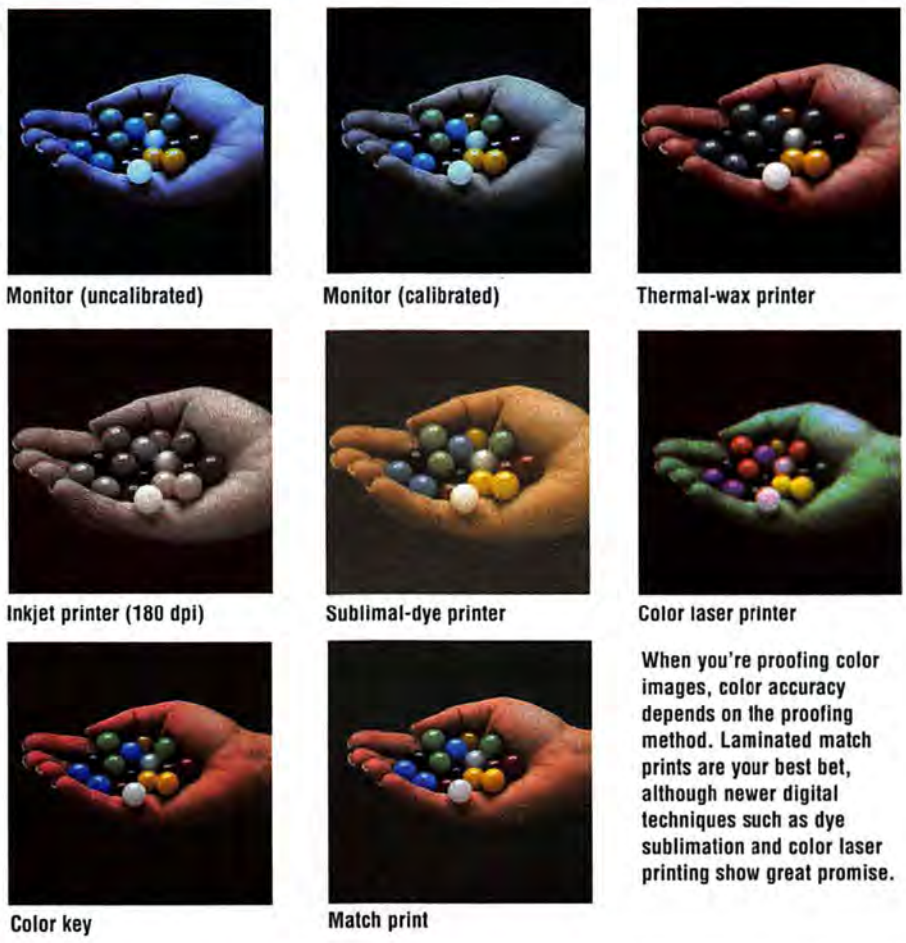
Film Proofs

The most accurate way for you to preview what you'll see on the printed page is to generate a four-color proof directly from the separated films that a PostScript image-setter creates. Because the proof is created from the same film that your printer will use to make the press plates, it will give you the truest rendition of the printed piece. Film proofs have been used for many years. Although they are generally the most expensive type of proof — $30 to $50 per page for a set of four films — film proofs are worth the price, and there is no real substitute.

Although these devices are extremely useful, you shouldn't use thermal-wax proofs to make critical color decisions, and they can't render continuous-tone photographs accurately.

There are several kinds of film proofs available, each with its own advantages and disadvantages. We can divide these into two basic categories: *overlay* and *laminated*. The overlay method, often referred to as a *color key*, uses four sheets of acetate that are laid on top of each other to create the full color image. The advantage is that the individual layers can be split apart so that you can view each color plate separately. This allows you to analyze in detail the specifics of a color separation, such as the amount of black generation or maximum ink densities. The disadvantage of overlay proofs is that they are not reliable for overall color accuracy. The thickness of the acetate and the space between layers tend to

Figure 2: Chroma Chameleons



When you're proofing color images, color accuracy depends on the proofing method. Laminated match prints are your best bet, although newer digital techniques such as dye sublimation and color laser printing show great promise.

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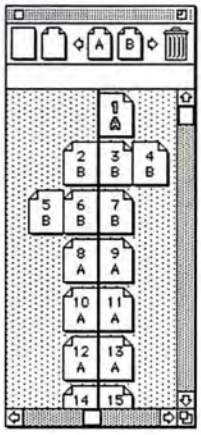


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produce a misleading image.

The laminated proof, also called a *match print*, provides superior color accuracy, but you can't separate the various plates because the four color layers are permanently fused together and mounted onto a paper backing by a high-pressure roller. If you prefer, you can laminate the proof directly onto the same stock that will be used for printing. If you are using custom-mixed spot colors, you may want to use a special kind of laminated proof called a *Cromalin*. A Cromalin is more expensive than a standard match print, but it uses powdered inks to produce accurate renditions of custom colors. Laminated proofs are strongly recommended for any work where color accuracy is critical. In fact, many commercial printers require them for use in compensating for press variables at print time.

Laminated proofs are strongly recommended for any work in which color accuracy is critical — in fact, many commercial printers require them.

Even if you use a color printer to produce a color proof from the Mac, you should strongly consider proofing the film with a color key or match print as well. The extra money that you spend here could save you hundreds or even thousands of dollars down the line. Although new technologies may soon bring us a more reliable means of accurately producing color proofs directly from the computer, there are still no substitutes for the old proofing standards.

What Is 'Reachable' Color?

Careful color proofing is essential if you want to predict the results of printing with inks on paper, but no matter how meticulous you are, there's no way to guarantee a perfect outcome. Factors such as paper texture, ink characteristics, and the idiosyncrasies of the printing press can drastically alter the final outcome. More importantly, not all colors can be reproduced by process-color inks. In fact, only a small part of the visible spectrum is actually "reachable" on a printed page.

The available range of colors is known as a *gamut*, and it varies greatly with each step of the production process. Color monitors have a very different gamut from that of CMYK (cyan, magenta, yellow, black) inks, which often results in a discrepancy between what you see on-screen and what you see in print. A color proof generated from film separations has a still different gamut, although the proof is usually much closer to the printed page than to the color monitor. Moving from the RGB (red, green, blue) color model of the monitor to the CMYK color model of the printing process is extremely tricky and is one of the major stumbling blocks in successful desktop color-prepress work.

It's important to remember that the computer allows access to many colors that can't be printed. This is especially true for programs that use the RGB color model, such as Studio/8 and PixelPaint. You can keep this from being a problem by working with CMYK color specs wherever possible. By learning which colors are actually reachable, you will greatly improve your chances of printing what you create. Remember that the available color gamut will vary, depending on the specific output device and printing quality. For instance, the high quality of the magazine-printing process can reproduce many more colors than are available in the newspaper-printing process.

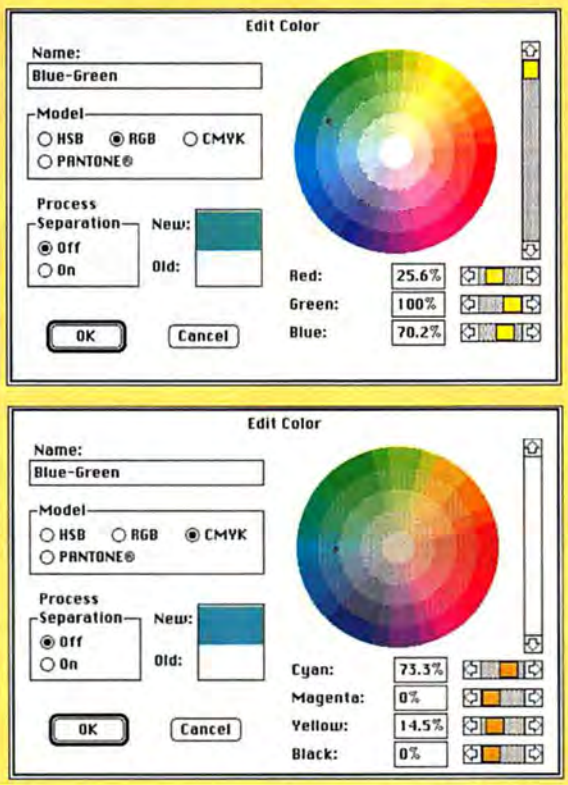


Figure A: Not all the colors available through the Apple Color Picker can be printed. QuarkXPress offers a visual example of this phenomenon by letting us switch between the RGB and CMYK color modes. Notice how the color selected in RGB mode (top) shifts drastically when we switch to CMYK mode. We have just discovered a color that's unreachable in process-color printing.

Although this color-matching problem has always existed, solutions have only recently begun to appear on the Mac. Tektronix offers TekColor, a cdev that replaces the standard Apple Color Picker with hue leaves indicating the colors that a particular monitor and output device have in common (see "The TekColor Solution," May '90, Buyer's Guide, page 18). Adobe's Photoshop displays an exclamation point when you attempt to choose a nonprintable color, and most color applications now offer the option of working in CMYK mode.

The best way to avoid the pitfalls of nonreachable color is by experimentation. Try creating color palettes in your favorite graphics and page-layout programs. Remember to label each color swatch with its specifications so that you can remember exactly what you used. Have the files output as color separations, and generate match prints from the film. The tests will be more accurate if you use the same output device and line-screen frequency you will use to print your final documents. Compare the proof with the monitor display, and determine which are the reachable colors.

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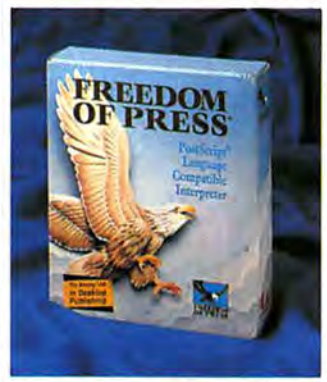
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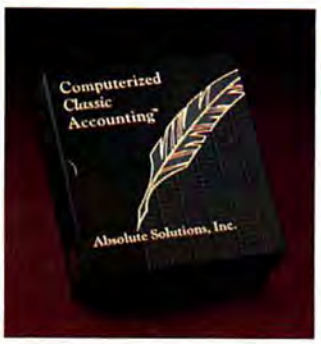


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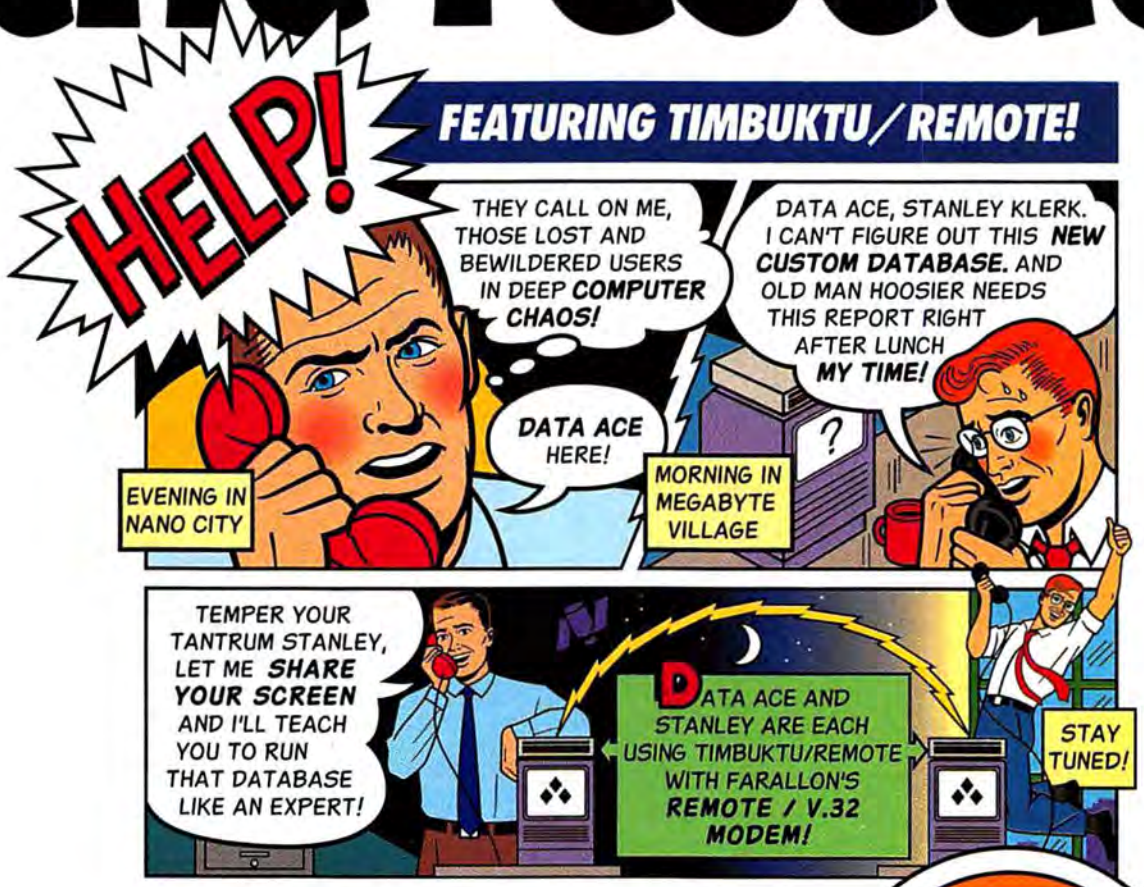
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Currents

HP Speaks AppleTalk

Hewlett-Packard has long been the leading vendor of desktop printers for DOS environments. Its LaserJets are among the most successful printers ever built. But for Mac users, who expect PostScript-capable printers accessible over LocalTalk networks, HP's popular offerings have not made the grade. The $1,195 DeskWriter, a 300-dpi monochrome inkjet printer, was the first HP product to break into the Mac market in a big way. HP recently expanded its offerings in the Mac printer market, however, releasing new versions of its DeskWriter and LaserJet lines that specifically address the needs of Mac users.

The QuickDraw-based DeskWriter is now shipping with built-in LocalTalk support. Users who bought the original DeskWriter, which was equipped only with an RS-232 serial port, can retrofit their printer with a LocalTalk interface for $149.

All of HP's current LaserJet models will be offered in Mac versions that include a LocalTalk interface, Adobe PostScript cartridge, and expanded printer RAM. The Mac-ready version of the LaserJet III, HP's standard 8-page-per-minute printer, has a list price of $4,355 and includes a 2-megabyte RAM expansion. The LaserJet III uses a new variable-dot imaging technique that HP claims improves the appearance of gray-scale images. (MacUser Labs will report on the LaserJet III in a future issue.)

The 8-page-per-minute LaserJet IID, HP's workhorse printer, has dual paper trays and, when configured with 4 megabytes of RAM, can print PostScript on both sides of a sheet of paper. It costs $5,360 with LocalTalk, PostScript, and a 2-megabyte RAM extension; the 4-megabyte version lists for $6,060.

For those who are more concerned about price than performance, HP offers the LaserJet IIP, which prints 4 pages per minute. The Macintosh version with LocalTalk, PostScript, and 2 megabytes of RAM lists for $3,455.

All three LaserJet Mac models should ship this quarter. HP has also released the PaintWriter XL, a 180-dpi color inkjet printer designed specifically for the Mac. The PaintWriter XL has a LocalTalk interface and a QuickDraw printer driver and lists for $2,995. For more information on these printers, contact Hewlett-Packard, 19310 Pruneridge Ave., Cupertino, CA 95014; (800) 752-0900.

— **Stephan Somogyi**

Is It E-Mail or Is It Fax?

Faxing has become the de facto standard for sending printed matter when time is of the essence; not even Federal Express' overnight service can compete. Using a Mac equipped with a fax modem and Adobe Type Manager, you can send faxes that come close to laser-printed quality. Although it can take some time to produce a fax on a Mac, you never have to deal with the crooked-paper-jammed-in-the-fax-machine syndrome.

Mac fax modems have been around for a while, but they have all been single-user devices. The only way several users could share one on a network was with a Shiva NetSerial interface. Solutions' FAXGATE Plus is the first product to offer an alternative.

The FAXGATE Plus package has two parts: gateway software, which runs on the same Mac as a Microsoft Mail or QuickMail server, and a MailMaker "printer" driver, which is copied to users' System Folders. To fax a formatted document from an application such as Word or PageMaker, you select the MailMaker icon in the Chooser (much as you would select an ImageWriter) and then select the print option. MailMaker sends the image data to the server via E-mail; FAXGATE then transfers it from the mail-server software to BackFAX, Solutions' fax-modem software, which must also be running on the server Mac. The time-consuming process of converting the Mac's QuickDraw image to Group 3 fax format is relegated to the server, leaving your Mac free to do other work. Converting on the server rather than on the user's Mac also cuts down on the amount of data sent over the network from the user's Mac to the server (although it may degrade mail performance on a busy mail server).

FAXGATE Plus costs $395 and comes with one copy of the gateway software and five copies of MailMaker; additional MailMaker five-packs are $195 each. You also need a copy of Solutions' BackFAX software for each E-mail server; if your fax modem doesn't come bundled with BackFAX, you can buy it separately for $245. In comparison, Shiva's NetSerial interface costs $399, but it isn't easy to make a fax modem and the NetSerial work together. For the average user who already has a mail server, FAXGATE is a better solution. Solutions, 30 Commerce St., Williston, VT 05495 (802) 865-9220.

— **Stephan Somogyi**

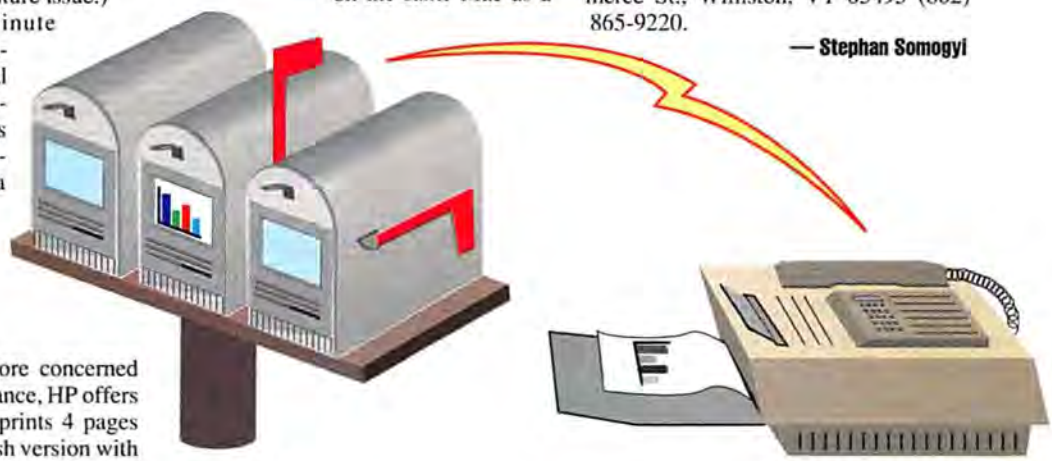
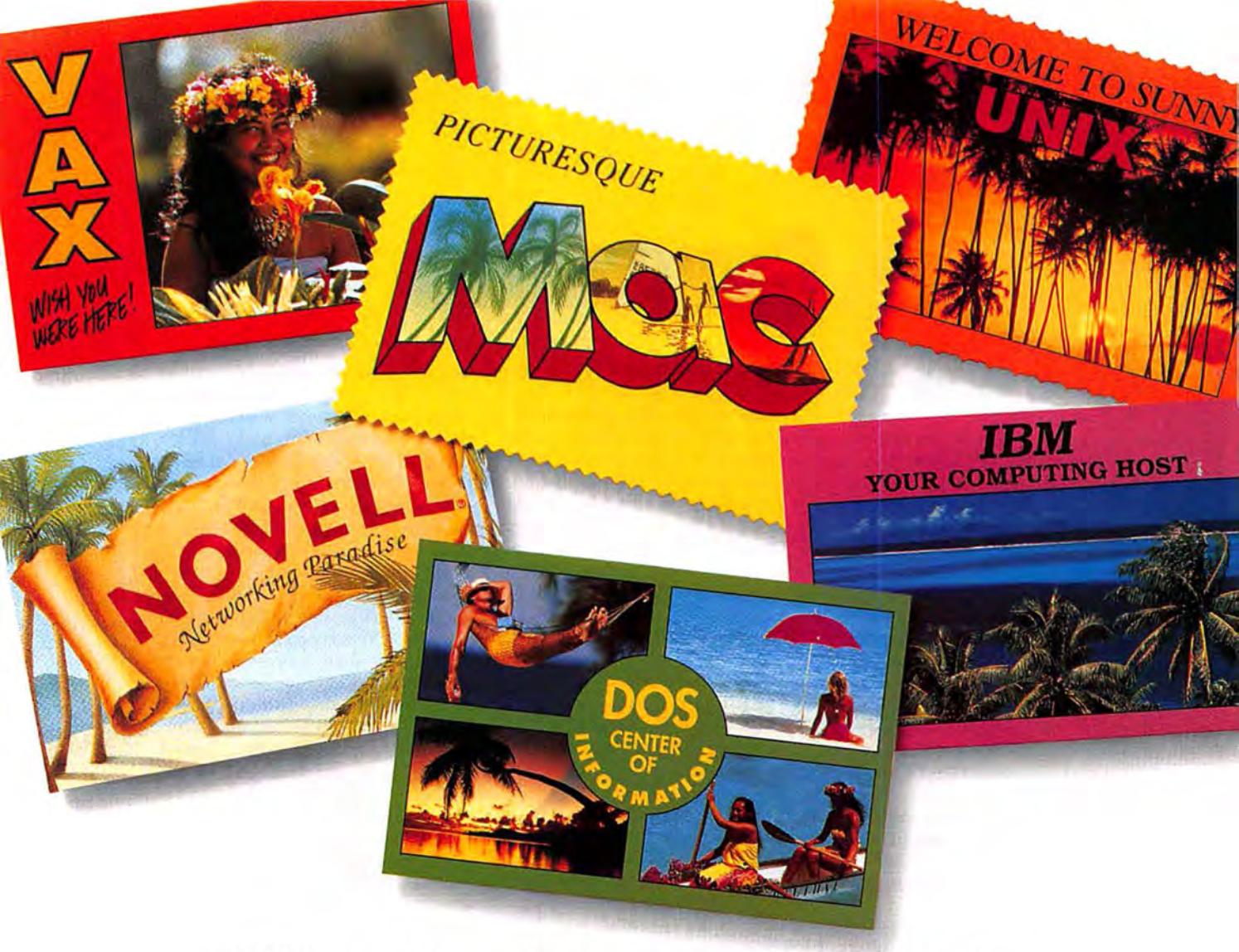


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Apple/DEC Alliance: Together at Last

What do you get when you cross DECnet with AppleTalk? A two-year wait and some dynamite software — DECLanWORKS for Macintosh.

You might have given up wondering when Apple and DEC were going to produce some tangible results from the highly touted alliance they declared back in January '88. They vowed to make Macs and VAXes, AppleTalk and DECnet, work together seamlessly, like loving members of one big happy family. But since this engagement was announced, both companies have kept mum about the wedding date.

Figure 1: DECnet Tunneling

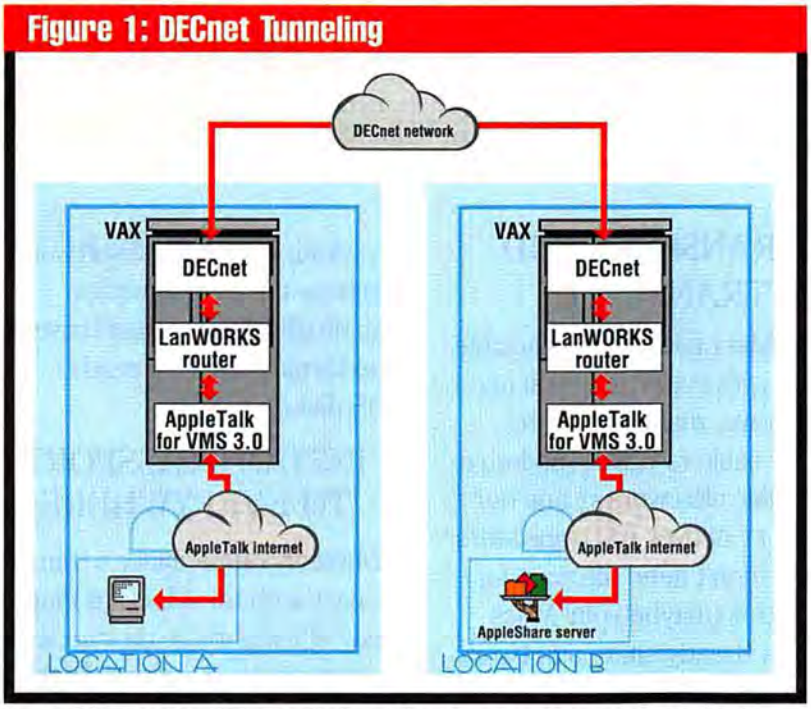


Figure 1: AppleTalk for VMS 3.0 will allow DECnet tunneling. Users on one AppleTalk internet will be able to access resources (such as an AppleShare file server) on a second remote AppleTalk internet, using DECnet as an intermediary.

By Henry Bortman

Well, the wait is over, and it seems as if it was worth it. At a May 1 ceremony in New York City, DEC chief Ken Olsen and Apple's John Sculley tied the knot and lifted the veil from DEC LanWORKS for Macintosh. The list of features is so legion that it's difficult to do it justice. This first report is a little heavy on network jargon, but if you ever dreamed of connecting Macs to VAXes, hold on to your hats and read on. Remember that *all* of this is going to be provided in *one* very inexpensive package.

AppleTalk on the VAX

There are currently two AppleTalk for VMS products — version 2.0.6 if you have a Phase 1 internet, and version 2.1 if you're running Phase 2. It creates a "virtual" AppleTalk network in software on the VAX. This approach is kludgey and slow, which limits what the Mac and the VAX can do together. In contrast, the upcoming version 3.0 will be fully integrated into the VMS kernel (core system software) and will turn a VAX into a true AppleTalk node. The most immediate benefit of the new approach will be a significant boost in performance.

On top of this integrated AppleTalk base, LanWORKS will include an AppleTalk router, a fully AFP-compliant file server, and a PostScript print server (spooler), and it will provide DECnet "tunneling" of AppleTalk data. AppleTalk file and print servers for the VAX are currently available from Pacer and Alisa, but the router and DECnet tunneling capabilities have never been offered before. Note that all these services will implement AppleTalk Phase 2 protocols only, not Phase 1. If you've been biding your time, resisting the upgrade from Phase 1 to Phase 2, you're going to have to bite the bullet if you want to run LanWORKS.

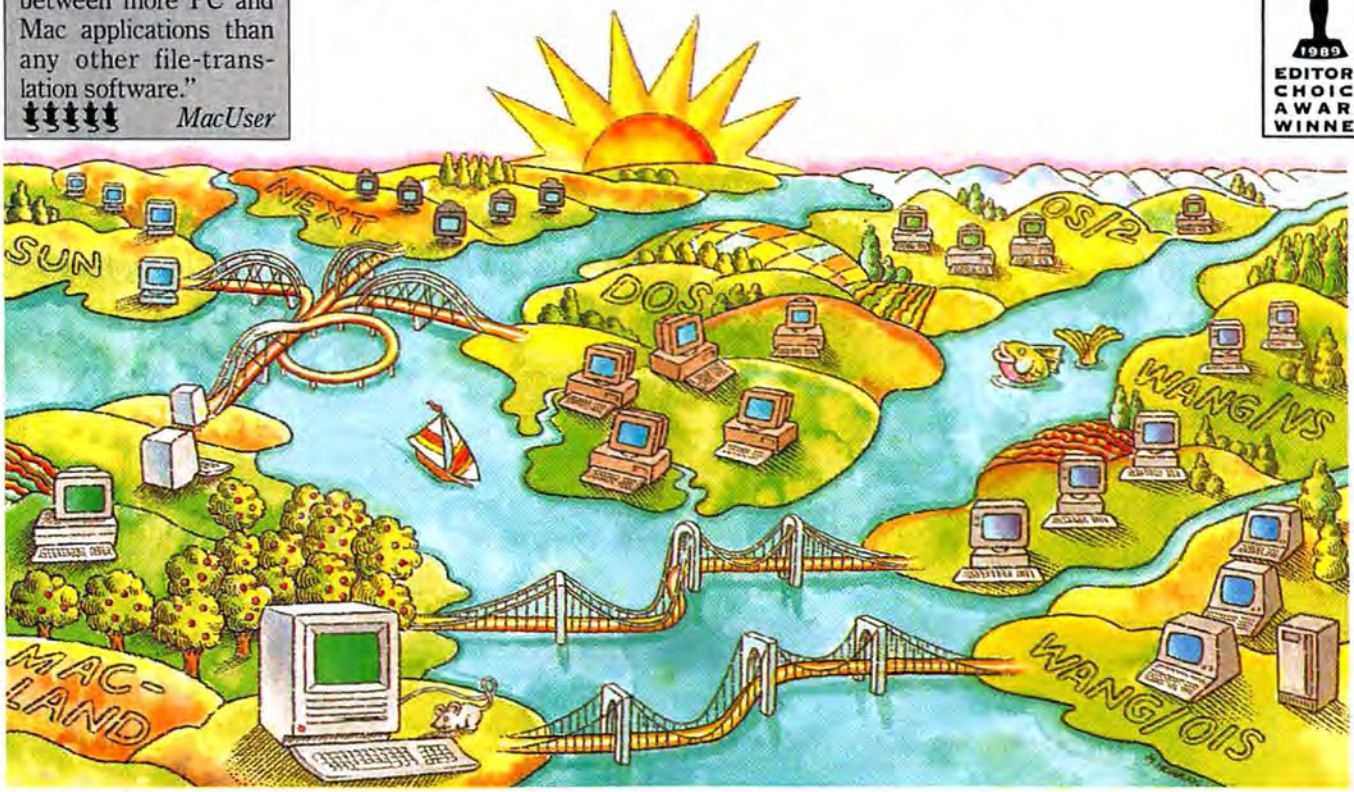
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will be able to share files easily. Files stored on VAX share volumes will appear to Mac users as if they are on an AppleShare server; to VAX users, they'll appear as regular VMS files. DEC already offers a product called PCSA (Personal Computer Systems Architecture) that integrates DOS-based PCs and VMS-based VAXes. It enables VAX and PC users to share files via an SMB file server. If users run both PCSA and LanWORKS, then Macs, PCs, and VAX-terminal users will all be able to share the same files.

The VAXshare print server will allow any Mac or VAX-terminal user to access any PostScript printer on either DECnet or AppleTalk networks. The AppleTalk for VMS router will allow a VAX system manager to connect multiple EtherTalk networks to a single VAX computer and will route data among them. Direct LocalTalk connection to the VAX will still not be supported. And DECnet tunneling will let Macs on one AppleTalk network communicate — *through* a series of VAXes connected on a DECnet network — with Macs, AppleShare file servers, and printers on other AppleTalk networks (see Figure 1).

More Connections

If AppleTalk isn't your thing, LanWORKS will provide three other sets of connection tools: one set for terminal emulation, another for turning your Mac into a DECnet node, and a third for TCP/IP connections. On the terminal-emulation side, LanWORKS will include the Macintosh Communications Toolbox with some new connection tools, and a new multisession version of MacTerminal with scroll-back capability. Using this software, a Mac will be able to open multiple VT-102 or VT-320 terminal sessions on the VAX.

Along with the serial and modem connections already announced by Apple for the Communications Toolbox as part of System 7, LanWORKS will provide LAT and CTerm connections. LAT is a DEC terminal-access protocol that efficiently packages keystrokes from multiple terminals or multiple terminal sessions on a single terminal. This reduces the strain that processing terminal users' keystrokes places on a VAX CPU. LAT requires Ethernet, however. CTerm connections will also be supported. CTerm, which is another DEC terminal-communications protocol, will allow Macs on LocalTalk to open terminal sessions with a VAX.

DECnet for Macintosh implements the DECnet protocol stack on the Macintosh, turning it into a full DECnet "end node." Two DECnet-based applications are also included: an NCP (network control program) for configuring the Mac as a DECnet node, and NetCopy, a file-transfer utility that enables VAX-based DECnet nodes to initiate file transfers from the Mac's hard disk.

But suppose you have a VMS application — perhaps videotext or a custom application — that was written with the assumption that it would be used on a DECnet node on Ethernet, but your Mac is on a LocalTalk network. You can't use AppleTalk to communicate with the application because it understands only DECnet. And, unless you have a Kinetics FastPath 4, which provides DECnet routing for LocalTalk-based Macs, there is no way for you to communicate with the DECnet-based application. Other EtherTalk-to-LocalTalk routers don't offer DECnet routing (see "EtherTalk-to-LocalTalk Routers," June '90, Buyer's Guide, page 42), and other software that allows Macs to act as DECnet nodes requires the Macs to be on Ethernet. LanWORKS solves this problem by providing an AppleTalk/DECnet Transport Gateway (see Figure 2). The gateway sits between the two networks and repackages data packets so that each side sends and receives packets in its own native format.

Finally, if you use TCP/IP protocols rather than DECnet or AppleTalk, don't worry — they'll also be supported. MacTCP will also be part of the LanWORKS package. This will facilitate Mac connections to VAXes running ULTRIX (DEC's UNIX implementation) as well as to VMS-based VAXes.

Painless Windows

If ASCII text bores you, MacX — Apple's implementation of X Window protocols — will also be included in LanWORKS. MacX will let Macs run VAX-based X Window applications. (X Window, developed by MIT, is widely used by UNIX systems to provide a basis for a graphical user interface.) DEC has adopted X Window and added certain enhancements, such as a special set of fonts, to create DECwindows. DECwindows is DEC's standard windowing interface for both its VMS and its ULTRIX

Figure 2: AppleTalk/DECnet Transport Gateway

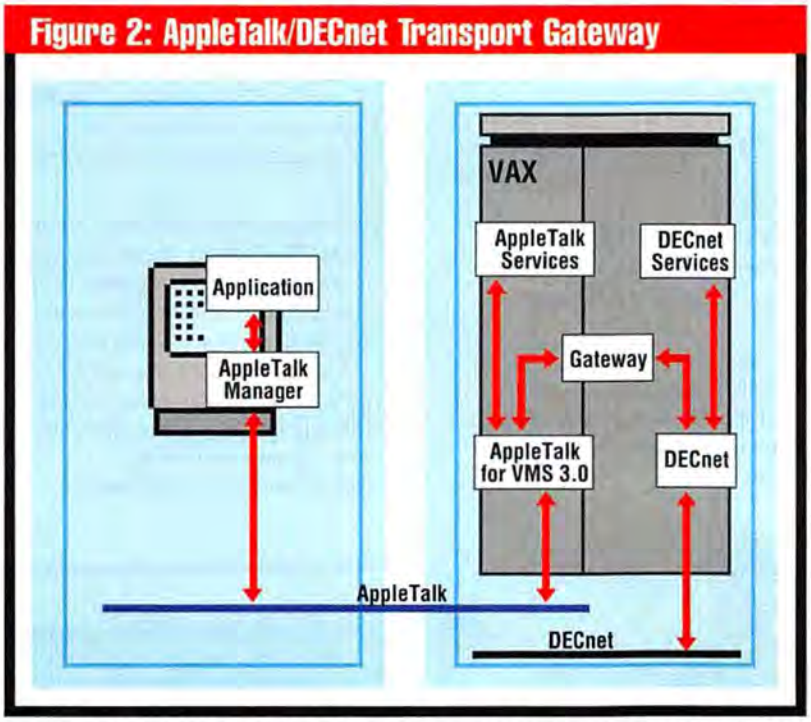


Figure 2: Using the AppleTalk/DECnet Transport Gateway, a Mac user on AppleTalk will be able to access applications or services (such as videotext) that would otherwise be accessible only to Macs or other users on DECnet.

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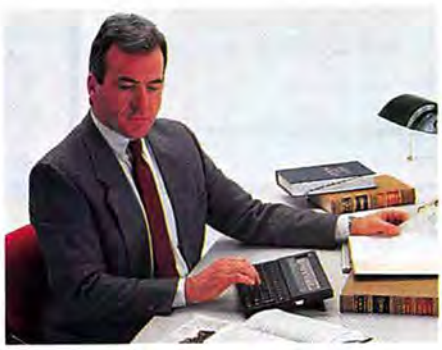
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VAX systems. The version of MacX included in LanWORKS will provide support for DECwindows. Users will be able to cut and paste ASCII text (typeface and point-size information will be lost) and some graphics between DECwindows and native Macintosh applications. DECwindows connections will be possible over AppleTalk, DECnet, and TCP/IP.

Mailboxes and Databases

Not happy yet? You want to exchange mail between Mac and VAX users? You've got it. LanWORKS will include a Mac application for accessing VMS Mail servers. And when DEC ships its new ALL-IN-1 Mail server (ALL-IN-1 Mail is a forthcoming X.400-based mail system), LanWORKS will accommodate Mac users by providing an application for it as well. As with other services, Macs will be able to access VAX-based mail services by using AppleTalk, DECnet, or Communication Toolbox connections.

Wondering about connections to VAX-based Rdb/VMS, Oracle, Ingres, Informix, or Sybase databases? There's good news for you too. You've heard of CL/1, the database-connectivity language that provides Mac applications with a consistent method of accessing VAX-bound data. It's been renamed DAL (Data-Access Language), and the server (for VMS) will be built into LanWORKS.

For a Mac application to connect to a VAX database via DAL, the VAX must have the DAL server plus a *database-adapter module* for the specific database product being accessed. LanWORKS will include only one DAL database-adapter module for Rdb/VMS (Digital's SQL database product). Database-adapter modules for the other database products I've mentioned will be provided either by Apple, through APDA, or the database vendors.

Unfortunately, although LanWORKS will provide new CL/1 (oops, sorry, I mean DAL) client software — that's the piece you must have in your System Folder to make DAL connections to a VAX database — it will support only AppleTalk and serial connections on initial release. No DECnet, LAT, CTerm, or TCP/IP connections yet. Guess you have to leave something for version 2.

DEC's SQL/Services for the Macintosh provides remote access and a programming interface for applications to communicate with Rdb databases. It will be offered as part of a separate DEC product. SQL/Services provides a variety of workstation and terminal types — not just Macs — with a consistent way to access DEC's Rdb databases.

What About File Translation?

I thought you'd never ask. DEC has developed (and is promoting as a standard) the CDA (Compound-Document Architecture), a comprehensive set of rules describing the use of compound



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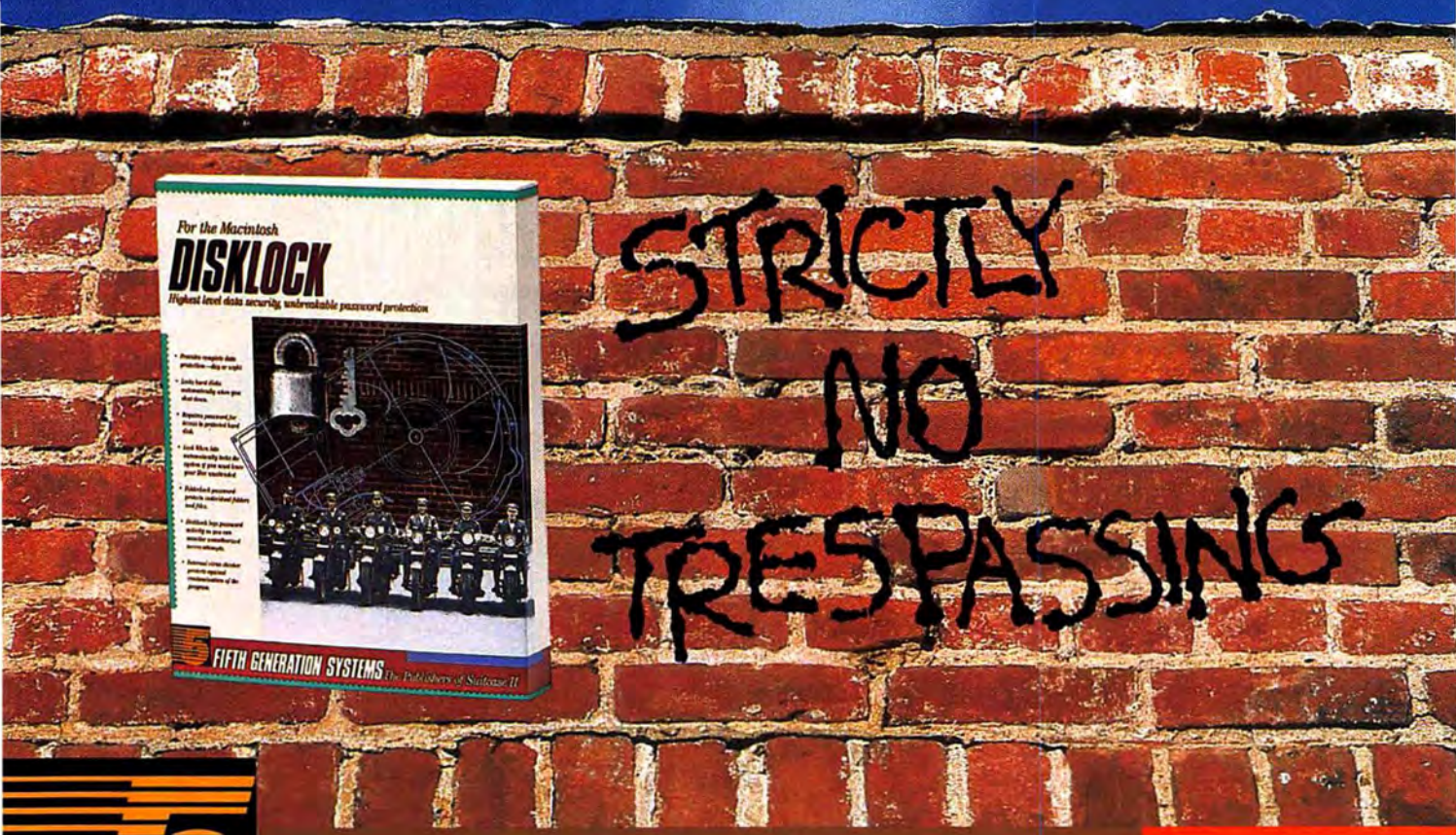
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documents — documents that contain styled text, bit maps, and object graphics — in a computing environment. These rules include the creation, display, on-screen modification, and disk storage of compound documents. DDIF (Digital Document Interchange Format) describes the file format used for storing CDA files on-disk. An increasing number of VAX-based applications allow users to save their work as DDIF files.

LanWORKS includes a DDIF converter tool kit that runs on the VAX and provides converters to translate between DDIF and MacWrite, MacPaint, and PICT documents. Only PICT 1 format is supported, so there are no color or gray-scale capabilities. But that's not the worst of it. Unfortunately, a Mac-based translation tool didn't make the first cut of LanWORKS. If you really want to, you can do it from a Mac — sort of. You have to run a terminal session and invoke the converter tool kit on the VAX from the terminal's command-line prompt. Oh well, even seamless integration sometimes has a little run in the nylon. Uh, Apple? DEC? I think this area still needs some work. Shall we call this a third-party opportunity?

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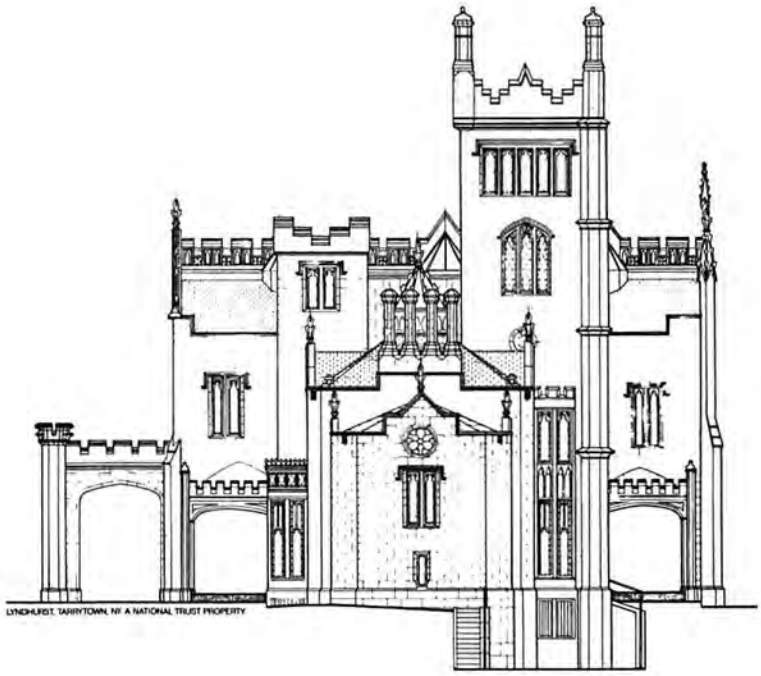
Five hundred dollars. Yes, that's *hundred*. For a mere $500, you can acquire all this stuff, complete with documentation, and install it on your VAX. But you can't use it.

If you want a user license, it costs extra. Are you scared? Don't worry. It's only $300 per Mac. Still cheap. Really cheap. Outrageously cheap. If you add up the cost of equivalent third-party products — and some of the features offered by LanWORKS haven't been implemented by anyone else yet — you're talking thousands or tens of thousands of dollars.

One more thing. Apple Computer is going to heavily promote DEC LanWORKS for Macintosh (as it should), but DEC is going to sell it and support it. Support contracts will cost extra, of course, as DEC support contracts are wont to do. You can contact DEC at 146 Main St., Maynard, MA 01754; (800) 344-4825 or (508) 493-7161.

DEC LanWORKS for Macintosh is an incredibly impressive, inexpensive package that makes a qualitative leap in Mac-to-VAX integration. Never mind that it has a dorky name. If you have Mac computers and VAXes and want them to communicate, you'll want LanWORKS. It's as simple as that. We'll have a report soon on how it'll change the market for third-party vendors such as Alisa and Pacer.

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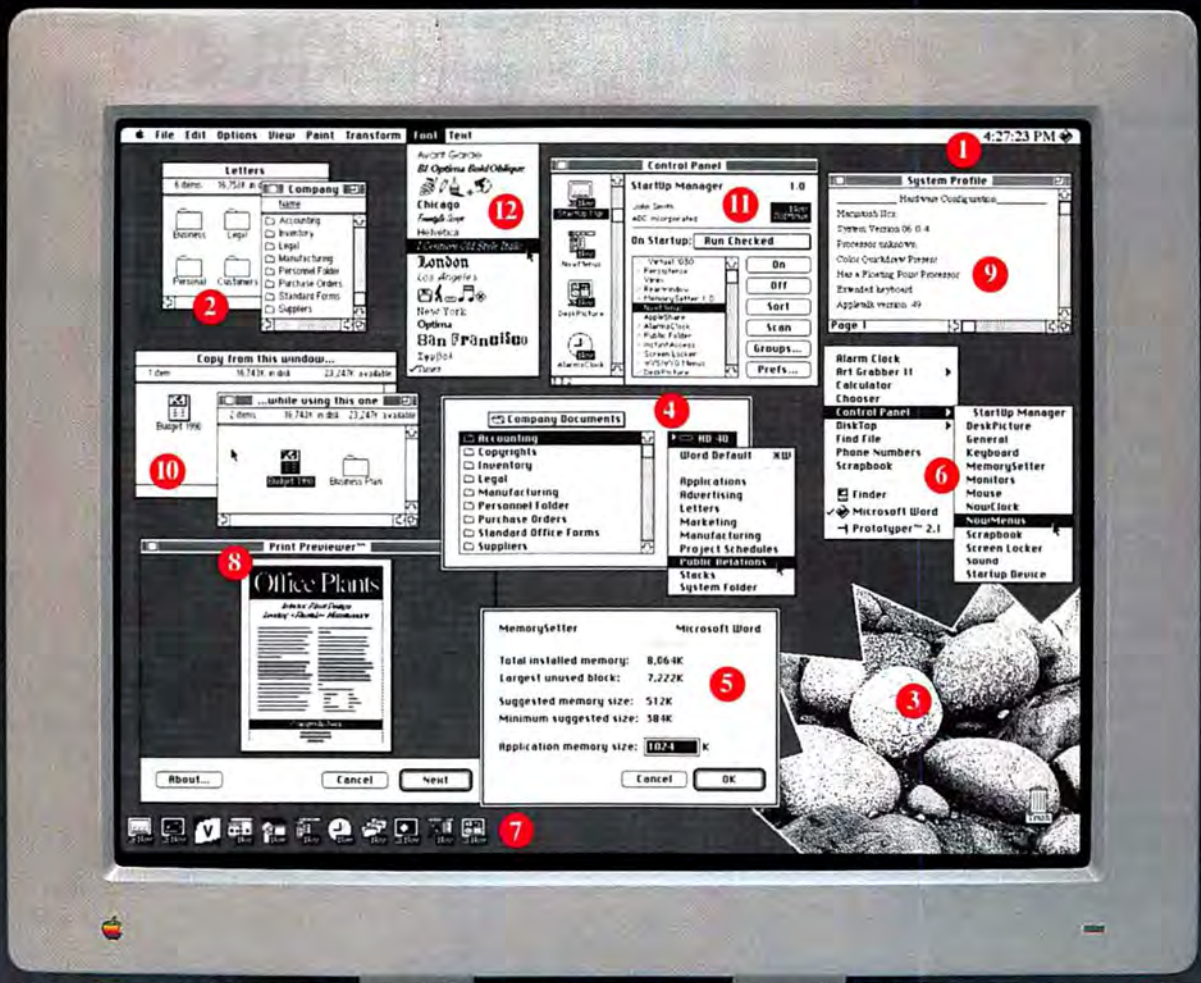
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Sharing without AppleShare

Want AppleShare compatibility but can't afford to dedicate a Mac as a server? Try these alternatives.

Next to printing, sharing files is the most common reason for using a Mac network. AppleShare, Apple's own server product, requires a dedicated Mac. It provides a central place to put files, including data (such as databases) that is shared by multiple users. AppleShare is based on the AFP (AppleTalk Filing Protocol), one of the protocols in the AppleTalk Networking System. AFP has two parts, a client part and a server part.

On the server side, AFP provides access privileges. When you mount a local hard-disk volume on your desktop, you can get at any of your files in any folder. But when you mount (or log on to) an AppleShare server volume, you can be granted access to the files in some folders and denied access to others.

The AFP server also features byte-range locking. When more than one user needs to get access to the same file at the same time — the best example is a multi-user database file — data corruption can occur unless some rules are set. Byte-range locking locks out all but one user at a time from writing over specific bytes of data in a file (a particular record in a database, for example). Other users can access the file, and even the same record, but for reading purposes only.

Many other vendors have implemented AFP on non-Mac platforms. For example, Novell now supports AFP with its PC-based NetWare product, Pacer and Alisa Systems have implemented AFP-compliant servers that run on DEC VAXes, and IPT's uShare implements AFP servers on several UNIX platforms.

Because all these servers follow the AFP rules, users can access them through the AppleShare *client* software. When you install AppleShare on your Mac with the System Installer, the installer puts an AppleShare INIT into your System Folder. The next time you boot up, an AppleShare icon appears in your Chooser. Clicking on the AppleShare icon shows you a list of all the AFP servers available to you — whether they are "true" AppleShare servers, NetWare, or CareBear-Share (not a real product, but you never know).

AppleShare requires that you dedicate a Mac to the task of being a server (at least until System 7 comes out). For many people, even the cost of a Mac Plus ($1,799 list), when combined with the cost of AppleShare File Server software ($799), is too high a price to pay for file sharing. Many users would rather be able to share files directly from one workstation to another without dedicating a server. This nondedicated server approach is called *point to point*.

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Figure 1: Sharing Solutions

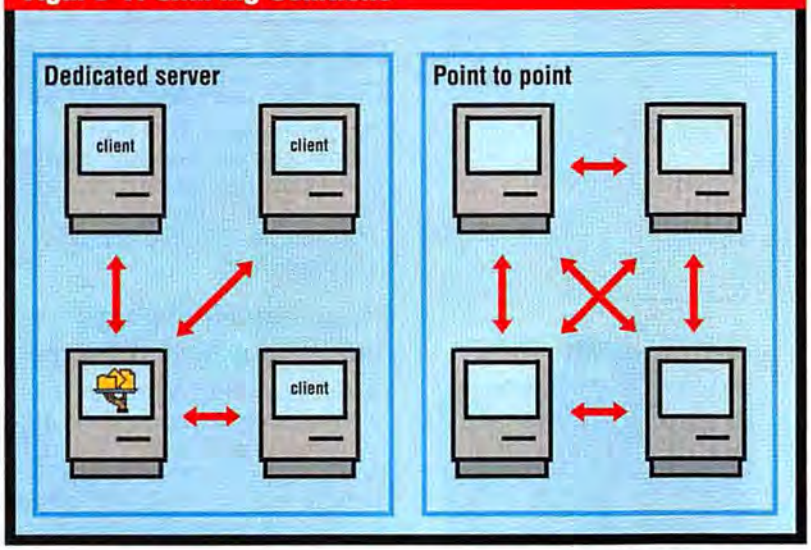


Figure 1: With a dedicated server, files travel over the network between clients and the server; to move a file from one client to the other, you must go via the server. In a point-to-point environment, files can move directly between any two Macs on the network.

By Stephan Somogyi

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low-cost point-to-point alternative to AppleShare (see "Two for the Node," May '89, page 161). It lets users "publish" their local Mac volumes to allow other users on the net to access them. Rather than having a central server, anyone on the net can get at anyone else's local hard-disk drive. Although TOPS 3.0 supports byte-range locking (previous versions had some problems), it doesn't implement AFP access privileges, and volumes published by TOPS cannot be accessed via the AppleShare icon in the Chooser; you have to use a separate TOPS DA.

Point-to-point (nondedicated) AFP servers seem an ideal alternative: They provide a single, standard user interface (AppleShare client) for volumes local to other users' Macs on the network. With nondedicated AFP file servers, you can share files between any number of Macs on a network by moving files directly from one Mac to another without a server. Point-to-point AFP servers can coexist with dedicated servers; in fact, when both are used, the dedicated servers' loads can be reduced.

Apple has announced that Macintosh FileShare, a full nondedicated AFP server, will be an integral part of System 7 (see "AppleShare without Servers?" April '90, page 276). In the interim, several nondedicated AFP servers with different feature sets are available for use with System 6. Here's a look at these alternatives.

According to Apple, Macintosh FileShare will be an integral part of System 7.

DataClub

International Business Software markets DataClub, which provides file sharing, using a unique metaphor. You see only a single DataClub volume on the network, but there doesn't need to be a central server. Files that appear on your desktop as part of a single DataClub volume are actually distributed around the network on different users' local hard disks. If you want to make files available to other users on the network, you must copy the files to the DataClub volume. Instead of being physically copied to a central server, the files remain on the local hard disk in a reserved area maintained by DataClub that grows and shrinks as necessary.

This single-volume metaphor helps keep the number of volumes on the desktop down to a minimum. (With other nondedicated servers, if all the users in a work group mount each others' volumes, the desktops on their Macs can become hopelessly cluttered.)

What if you want to work on a file that physically resides on someone else's hard disk, however, and you don't want the sluggish performance that's typically associated with doing this type of work over a LocalTalk network? When DataClub is active, the Finder's Get Info dialog box gains an extra item that displays the physical location of a file on the DataClub volume. If you have the right privileges, you can move a file from one physical volume to another without changing the folder in which it appears on the DataClub volume.

For example, if you're going to be out of the office and you want to turn off your computer while you're gone, you can physically move a file to the shared area on a coworker's hard disk. No one using the file will notice the change in its physical location. If a user goes off-line without moving a shared file to another machine, DataClub tells the Finder to gray out the icons of the files on that Mac. The location, name, and type of the files in a



Figure 2: DataClub extends the Finder's Get Info dialog box with a pop-up menu that indicates where a file on the DataClub volume resides physically.



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folder remain, but the files themselves cannot be accessed.

DataClub implements full AFP access privileges and byte-range locking and doesn't require a dedicated Mac, and it goes one step further: It makes distributed data appear centralized — a clever innovation, and one that MacUser NetWorkShop is looking forward to testing. DataClub's pricing was not available at press time; the projected ship date is late summer.

allShare

McKenzie Brown designed allShare to provide only the functionality necessary for use with multiuser applications. Accordingly, allShare focuses on implementing byte-range locking rather than folder-level access privileges.

Implementing byte-range locking on a user's local hard disk is particularly tricky. If a shared database resides on a dedicated server, the database is not "local" to any one user. Since all users must log onto the server to access it, it is relatively easy to restrict any user. But if a shared database resides on a user's local volume, that user can gain unrestricted access to any file. allShare overcomes this problem by extending byte-range locking to local users, even though they are not logged on to the database via an AppleShare client.

allShare doesn't need much in the way of configuration. Users can prioritize how much impact allShare has on their local Mac's performance as well as disable the ability of remote users to delete files on local volumes. There are no user lists or groups to administer — a single password allows access to the local Mac's storage. allShare doesn't support access privileges to folders on a volume; it lets each user publish either an entire local volume, a specific folder, or a local volume with one folder protected.

For work groups that just need to move files around and use multiuser applications, allShare fits the bill. While it is simplistic in its security, the low price — $249 per zone with a maximum of 254 user/servers per zone — makes allShare very attractive.

EasyShare

EasyShare, from ShirtPocket Software, is a simple file-sharing solution for those who need nothing more than access to other users' volumes to copy files or move them back and forth. Like TOPS, EasyShare's DA lets you set up a list of publishable volumes and folders; these can be set to be auto-published at startup time. EasyShare doesn't support the full range of standard AppleShare folder-level access privileges. The only access restriction it offers is that it allows you to set published volumes and folders to be read-only.

Many Macs aren't going to have enough RAM to make System 7 a viable option.

EasyShare doesn't currently support byte-range locking, but that feature is planned for a release that should be available by the time you read this. At $149.95 per ten nodes, EasyShare offers considerable flexibility in the selection of folders and volumes you can publish.

PSN

IPT's Personal Server Network was the first nondedicated AFP server to be released on the Mac market. It implements the full functionality of an AppleShare server, including byte-range locking, and even goes so far as to implement folder-level access privileges for folders on local users' machines. This functionality comes at a price. For byte-range locking to work, you have to put PSN into loopback mode and log on to your own Macintosh with the PSN administrator software. In loopback mode, access privileges are enforced for local users as well; you do not automatically have access to folders created by others on your own hard disk.

Furthermore, you must set PSN's administrator application as the startup application. Otherwise, shared volumes won't auto-publish and loopback won't work — an annoying constraint. Enforcing access privileges on local Macs is a nice feature, but PSN is not a security package. All you have to do to circumvent access privileges on a local machine is not use loopback mode or boot from a floppy. At $149 per node, PSN is also the most expensive of the products currently available.

Share and Share Alike

When System 7 becomes available later this year, it will include Macintosh FileShare, a full point-to-point implementation of AFP. Any user with 2 megabytes of RAM and System 7 software will be able to publish a local folder as an AppleShare volume. Macintosh FileShare will offer all the capabilities of allShare, EasyShare, or PSN — and it will come free with every Mac.

Many Macs won't have the RAM to make System 7 a viable option, however. Users of such Macintoshes, who are most likely on a limited budget, would be wise to consider all the available options, including TOPS, before deciding on a file-sharing solution. Each of them has its strengths and weaknesses, and DataClub offers a unique feature that System 7 will not offer: We haven't had a chance to test it yet, but DataClub's distributed-volume approach to file sharing is innovative and intriguing. You can expect a full report on it in a future issue.

Directory

allShare
McKenzie Brown Canada, Inc.
2176 Torquay Mews
Mississauga, Ontario L5N 2M6
Canada
(416) 569-3568
$249 per zone

DataClub
International Business Software
1270 Oakmead Parkway, Suite 314
Sunnyvale, CA 94088
(408) 720-0170
Price unavailable at press time

EasyShare
ShirtPocket Software
P.O. Box 40666
Mesa, AZ 85274-0666
(602) 966-7667
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Macs on the Internet: Talking TCP/IP

TCP/IP networks are nearly ubiquitous in corporate America and on university campuses. These products allow Macs to join the crowd.

In the Middle Ages, when traders from different countries wanted to communicate, they used a simple commonly known language called *lingua franca*. It wasn't as rich and detailed as their native languages, but it was certainly sufficient to get the point across.

When it comes to computers, the *lingua franca* is the communications protocol TCP/IP (transmission control protocol/internet protocol). TCP and IP are two of the five protocols standardized by the DOD (U.S. Department of Defense). They are also used extensively in corporate and university environments. TCP handles *reliable delivery:* It makes sure that data arrives at its destination intact and that the packets are received in the proper order. IP handles *addressing:* It is responsible for routing data packets from a source computer on one network through an internet to a destination computer that is often on another network.

The other three DOD protocols are Telnet, which provides terminal emulation; FTP (File Transfer Protocol); and SMTP (Simple Mail Transfer Protocol). These are application-level protocols that run "on top of" TCP/IP. That is, they use TCP/IP protocols to move data from one computer to another. The entire group of five protocols is often called TCP/IP, however.

TCP/IP doesn't let you do everything, but if all the protocols are implemented, it does allow users on computers from different vendors — even running different operating systems — to log on to each other's systems and exchange files and mail (see Figure 1). TCP/IP enables users to set up heterogeneous networks — that is, networks that have several different kinds of computers.

For Macs to participate as equals on TCP/IP networks, they must run software specifically designed to implement the TCP/IP protocols. Several vendors have released products that implement FTP, Telnet, or both (SMTP products are lagging behind).

Figure 1: The Universal Protocol

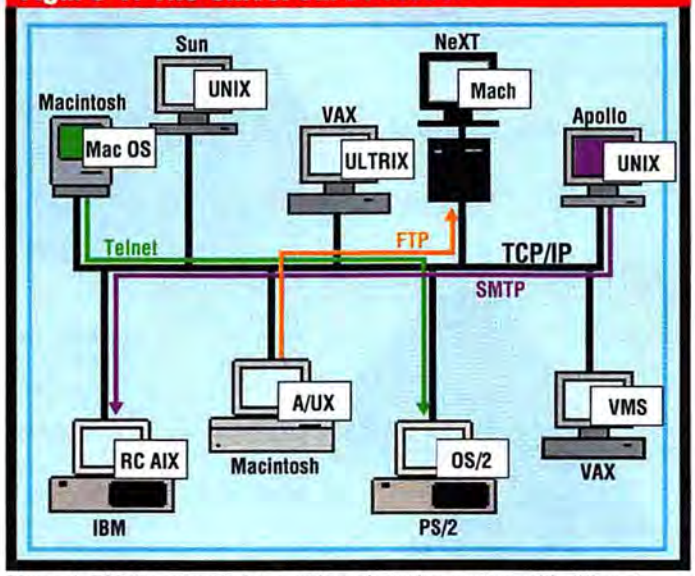


Figure 1: TCP/IP protocols let a wide variety of computers with different operating systems communicate with each other for simple tasks such as Telnet, FTP, and SMPT. To date, Telnet and FTP have been implemented for the Mac, but SMPT has not.

By Sharon Fisher and Dave Hull

Hello, World

TCP/IP was originally developed to allow computers that were running different operating systems to communicate. Variations of the Berkeley version of UNIX have TCP/IP built in, as do some variations of AT&T's UNIX. In addition, TCP/IP is supported on increasing numbers of other systems, including proprietary minicomputers (such as DEC VAXes), PCs running MS-DOS, and even IBM mainframe computers. (When IBM supports a protocol it didn't design, you *know* it has to be popular.) Consequently, a Macintosh running TCP/IP can communicate with a wide variety of systems

by employing a single program.

Some products enable Macs to communicate with certain systems — for example, the TOPS network-operating system lets Macs talk to MS-DOS PCs, various 3270 terminal-emulation products for IBM mainframes, and several Mac-DEC products for VAX minicomputers — but TCP/IP can provide a consistent interface to all of them. This way, you don't have to learn a new program each time you communicate with a different system.

Be forewarned that current TCP/IP applications are simplistic. They provide only basic terminal emulation and straight file transfer. The terminal emulation doesn't take advantage of the Mac's intelligence or user interface. The file transfer doesn't convert data to Macintosh file formats. Because the software has to handle many different types of systems, it can't be as efficient as system-specific software.

The Facts of TCP/IP Life

For this article, we looked at three commercial products that provide TCP/IP support, including the basic TCP and IP protocols in the form of Novell's TCPort or Apple's MacTCP: Net/One MacUWS version 1.0, from Ungermann-Bass; LAN WorkPlace for Macintosh version 1.1, from Novell; and TCP/Connect version 1.5, from InterCon Systems. We communicated between a Mac IIx client and a NeXT-workstation host over an Ethernet network.

In addition, several public-domain or shareware TCP/IP programs are available. These include TOPS Terminal, which was originally developed to be a commercial TOPS product but is now available free; NCSA Telnet, from the National Center for Supercomputing Applications at the University of Illinois at Champaign-Urbana; and Stanford MacIP, which is available only to university users. Some of these products are not easy to find, although NCSA Telnet seems to have made the rounds and to be fairly easy to find. If you know someone who can make you disk copies, you're in luck. Otherwise, you have to download them from an already existing TCP/IP network — a challenge if you don't have any TCP/IP software — and you will probably have to compile them yourself. Other vendors, such as White Pine and Pacer, have incorporated Telnet support into their terminal-emulation products, but they do not support FTP.

No matter which product you use, a few factors are universal. First, the systems you want to communicate with are almost certainly on an Ethernet network, so your Mac needs to be on one too. This can be either directly — with an Ethernet card or attached device — or indirectly, from a LocalTalk network through a TCP/IP gateway (see "EtherTalk-to-LocalTalk Routers," June '90, Buyer's Guide, page 42).

Second, the administrator of the remote system must create a user account for you on that system, incorporating the permissions that are required for remote access, and tell you what your account name is. The user name is a matter of security — it not only limits the users who can have access to the remote system, but it can also

Figure 2: The GUI of TCP/IP

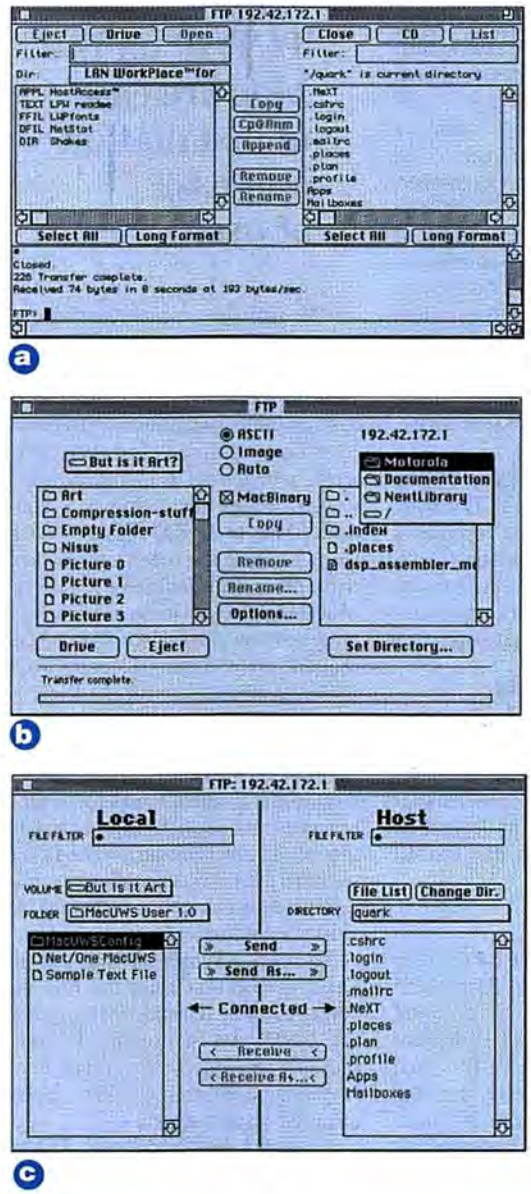


Figure 2: (a) Novell's LAN Workplace for Macintosh has a UNIX-directorylike file-transfer screen and command line for FTP, plus it provides a session log. (b) Intercon takes a more Mac-like approach in the FTP dialog box for TCP/Connect, using standard Mac icons for folders and files. (c) Ungermann-Bass' MacUWS gets half credit for Mac-likeness.

limit what files they can access. Your user account will probably also have a password.

Incidentally, some systems support a feature known as "anonymous FTP." This is an account created specifically so "guests" can log in and download files, such as text files or public-domain software and shareware, without having to create a separate account for each potential user. Find out more details about this option from your system administrator.

Addressing the Host

Third, you communicate with another computer over a TCP/IP network by logging onto it as a *remote host*. To do this, you have to know the IP addresses of both your system and the remote host. An IP address consists of four sets of numbers separated by periods, such as 192.42.172.1. As with a phone number, the component parts of an IP address refer to smaller and smaller sections of the network. For example, *MacUser*'s telephone number — (415) 378-5600 — can be broken down, respectively, into the San Francisco Bay Area, Foster City, and the specific part of Foster City where the offices are located. Further, with the correct extension number, you can access an individual's desk directly.

The numbers in an IP address can be similarly broken down. Each TCP/IP node on a given internet must be assigned a unique four-number combination, with the last of the four numbers (the *1* in our IP-address example) usually representing a specific node on the network.

Comparing the Products

We feel that the most important factors in running TCP/IP on the Mac are ease of installation and ease of use. Performance is certainly important in some installations, but it is more likely to depend on the network load than on the TCP/IP software used.

LAN WorkPlace

Novell's LAN WorkPlace for the Mac requires that the TCPort INIT be installed in the System Folder. You configure TCPort through the Control Panel and restart the Mac to activate it. But each time we installed the software, the Mac complained that it couldn't find its Ethernet drivers. Reinstalling the drivers whenever we installed the software fixed this problem. Once TCPort is installed, you run the HostAccess application.

Both Telnet and FTP are items on the LAN WorkPlace HostAccess File menu. To begin either a terminal-emulation or file-transfer session, you perform the usual log-in procedures: Enter the address of the host and proceed through the UNIX log-on sequence. Telnet turns the Macintosh into a UNIX terminal from which you can launch remote host applications.

The main benefits of running TCP/IP on the Mac are ease of installation and ease of use.

FTP displays a two-sided window; the left side represents the Mac, and the right side represents the remote UNIX system. Unfortunately, the remote-system directory structure looks more UNIX-like than Mac-like — you can't just click on folder icons to negotiate its hierarchy (see Figure 2a). From this dialog box, you can select Mac or UNIX files and click on Copy to move the files from one system to the other. You can create folders on the Mac, but you can't remove or copy them, although you can copy multiple files simultaneously. Trying to copy a whole folder produced an error message.

TCP/Connect

InterCon's TCP/Connect does not require the Control Panel for setup, but otherwise its configuration is similar to that of the other products. The first time we ran it after it was installed, we entered our IP number as well as that of the NeXT workstation (under Default Host).

To open a Telnet session, you select Open Connection from the File menu, enter your host ID, and are transported to the UNIX log-in prompt. If you run multiple sessions, you can type in a different name for each window in which a terminal session appears.

As with LAN WorkPlace, TCP/Connect presents FTP as a two-sided window, with the Mac represented on one side and the remote system on the other. You copy files by selecting them and clicking on a Copy button. Of the three products, InterCon's FTP interface is the most Mac-like, displaying Mac folder and file icons on both sides of the window (see Figure 2b). It won't let you create a new folder, however. And trying to copy a whole folder not only doesn't work, but it doesn't even produce an error message. You can copy multiple files, but you have to explicitly create each new Mac file when transferring from the remote system.

MacUWS

Like LAN WorkPlace, Ungermann-Bass' Net/One MacUWS has an INIT. It's called AdminTCP and is configured from the Control Panel. After several false starts with the AdminTCP dialog box, we learned that all we really had to do was enter the Mac's IP address in the IP Address field. We had kept trying to use complicated instructions because the manual never mentioned that we didn't need them.

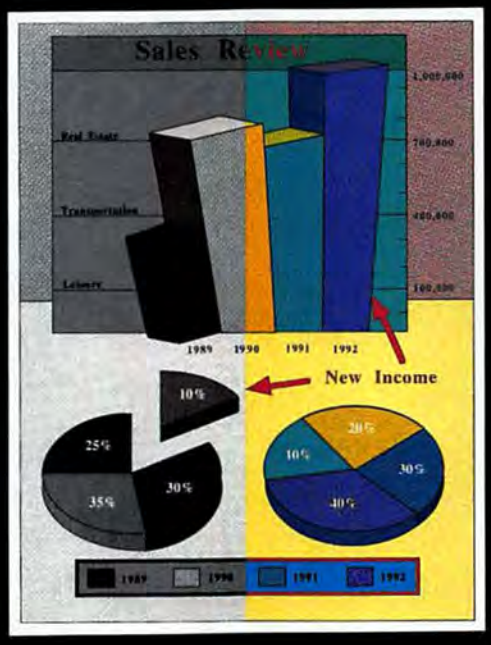
MacUWS uses a Window menu to open Telnet and FTP sessions. One nice feature of this program is that it lets you save the host ID and your user account name and password as Permanent, which simplifies subsequent log-ons.

MacUWS' FTP interface is, in terms of Mac-ness, midway between that of the other two products. You select volumes and folders to copy files, but it doesn't look like a typical Mac interface (see Figure 2c). You can create new folders but cannot delete them, and an error message appeared when we tried to copy them. The command is the same to either create new folders on the Mac or new directories on the remote system, so you have to pay attention to which window the cursor's in. Multiple-file copies are supported, but we got sporadic nonreproducible errors during some of these, which seemed to be related to the number of files copied.

Conclusions

No product stood out from the others as being either particularly good or particularly bad. LAN WorkPlace is the easiest to configure, whereas MacUWS is the hardest. TCP/Connect doesn't use the Control Panel, but it still requires some technoid configuration. TCP/Connect has the most Mac-like interface, which makes it easy to use, but it wouldn't let us create new folders.

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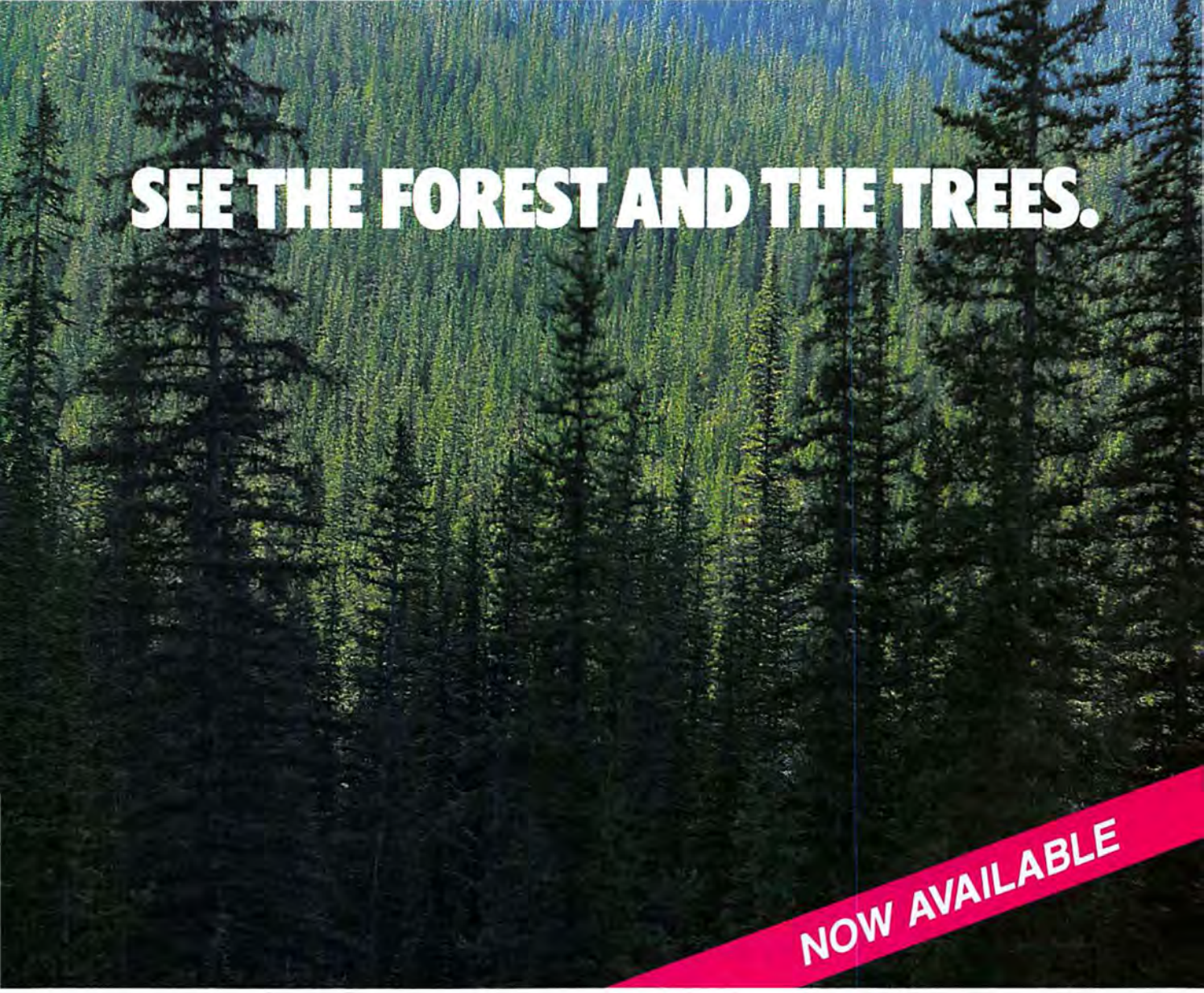
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The major feature that is missing from all these products is the ability to copy a Macintosh folder to the remote system. Both a Macintosh folder and a UNIX directory are hierarchical file structures. It seems surprising that none of the products is able to handle the translation between the two systems in a more transparent fashion.

The feature missing from all the products is the ability to copy a Mac folder to the remote system.

Considering the similarity of these products, unless you require a particular feature, you should probably make your decision on the basis of price. In that respect, LAN WorkPlace for Macintosh ($250) comes out on top. Stay tuned to the Bridges section for further developments. All these vendors are currently working on upgrades with expanded features.

Sharon Fisher is a San Francisco-based freelance writer specializing in computer communications. Dave Hull is the networking expert at the ComputerWare store in Sunnyvale, California.

Directory

TCP/Connect II
InterCon Systems Corp.
950 Herndon Parkway, Suite 390
Herndon, VA 22070
(703) 709-9890
$495

LAN WorkPlace for Macintosh
Novell
1340 Treat Blvd., Suite 500
Walnut Creek, CA 94596
(800) 526-5463 or (415) 947-0998
$250

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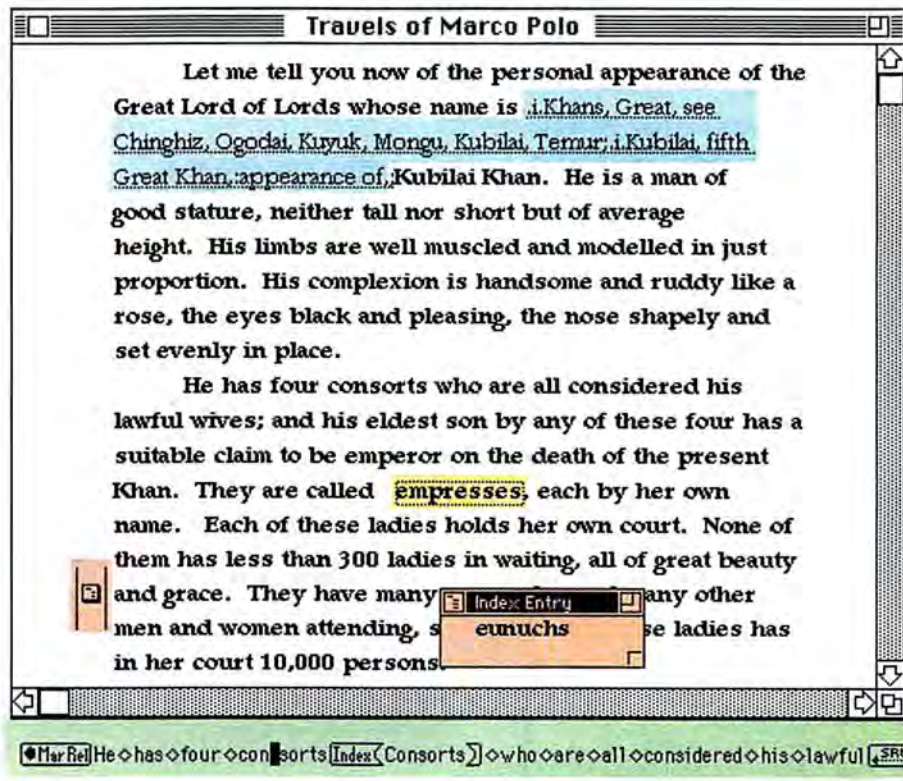
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Your book is almost finished, it has been accepted by a publisher, and you're ready to add the finishing touches: a table of contents and an index. The table of contents (TOC) is relatively easy, but developing an index can be an arduous task. If you plan ahead and use automatic TOC/index-generation tools, such as those found in the high-end word processors, you can eliminate most of the task's drudgery.

The TOC and Index

The table of contents and index are a reader's main entry points into a book. The TOC offers a general feel for the nature and structure of a document — finding out what broad topics are covered and how they are organized. The index is useful for looking up specific details and is often used before the main text of the book is read.

When you're deciding how to set up a TOC and index, you must think about the way readers will use your book. Do you want to use just chapter titles, or will you need subtopics in the TOC? In general, the more technical and structured documents are, the more subtopic levels you want. But the more detail you have in the TOC, the more difficult it can be for

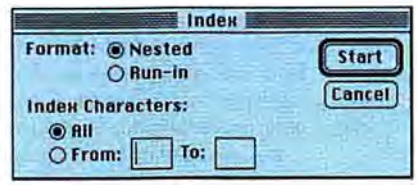


By Linda Iroff

Microsoft Word 4.0

Word is the only word processor that allows more than one level of subindexing, but there's no way to use extra levels to create separate indexes as you can with TOCs. Word also can print text, rather than the page number, after an indexed topic — useful for cross-referencing or for eliminating page numbers (by entering a blank space).

As the screen on the previous page illustrates, Word uses codes formatted as Hidden Text in order to mark TOC and index entries. This process causes some inconvenience and makes on-screen text rather difficult to read.



You must turn off Show Hidden Text in order to see proper line and page breaks (in both the Page and Galley views), and removing the codes often does not remove the Hidden Text formatting.

Nisus 2.03

Nisus, from Paragon Concepts, greatly simplifies the indexing process with its capability to search and index with one command. You can also mark entries as you work. The program's powerful search functions reduce the need to perform multiple searches for the same topic.

Nisus is the only major word-processing program that can merge indexes (a useful feature if your document is divided into several files) and place labels before each section of the index. It has tremendous formatting capability.

Nisus' powerful search-and-replace functions provide great flexibility. For example, macros available from Paragon can create an index from a separate list of words or can create several individual indexes if you want a separate index for book titles, proper names, or geographical locations. Macros can even be modified to create multiple TOCs.



Khans, Great, *see* Chinghiz, Ogodai, Kuyuk, Mongu, Kubilai, Temur
Khans, Western [of Kipchak or Golden Horde], *see* Batu, Barka, Mongu-temur, Tuda-mongu, Tulabugha, Toktai
Khotan, in Turkestan, 43
kings, mythical origins of, 91
obedient to own laws, 189
Kogatai, Tartar baron, 103-6
Kokachin, Tartar princess, bride for Arghun, 56-8, 112, 124-9
koumiss, Tartar drink, 178, 180

A thorough index demands a variety of formats. This sample includes a cross-reference generated by Word 4.0 at the top of the screen on the previous page.

FullWrite Professional 1.1

Ashton-Tate's FullWrite Professional is the only program that retains text styles when generating a TOC or index. That's partly because the text in the TOC and the index isn't editable: It's placed in separate chapters of the document. If you want to make a change, double-clicking on an item takes you to the appropriate entry panel, where changes can be made.

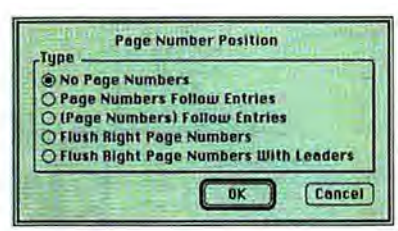
FullWrite's Re-reference command lets you link multiple items to one index entry. Thus, if you decide to change how an item is referenced in the index, you need to change it only once.

FullWrite is also the only word-processing program that generates and updates its index in real time. Although this makes FullWrite easier to use, it can also make it excruciatingly slow. In a large document, even a small editing change can mean you have to watch an Updating Index message for several minutes.

WordPerfect 1.03

WordPerfect's unusual Reveal Codes function, which displays TOC/index entries (and other formatting) outside the regular text window, may be confusing to users. In addition, the first word of each entry in the TOC or index is always capitalized — a feature that some users will curse and others will praise.

Although WordPerfect lets you mark items for generating a TOC and has an outlining function, you can't generate a TOC from the outline headings.



readers to find what they want.

The index can also have sublevels, although there is usually only one continuous directory. You may want to cross-reference items by using the phrase *see also*. The hard part of creating an index is deciding which items to include and how to name them so readers can quickly find information (a common complaint about computer handbooks is that readers can't find topics in the indexes even when the handbooks do cover the subjects).

How to Create a TOC and Index

Microsoft Word 4.0, Nisus 2.03, FullWrite Professional 1.1, and WordPerfect Mac 1.03 can significantly streamline the TOC/indexing process. With these high-end programs, you select all the text items that are to be part of the TOC or index as *TOC* or *index entries*, respectively. Formats for the TOC and the index are then specified, and they are automatically generated (FullWrite bypasses the last step by re-indexing on the fly). Some programs have an outlining feature that generates the TOC directly from outline headings.

You can mark index entries as you create a document, but some people find that this method interrupts the writing process. Another approach is to go through the text at any point during the writing/editing phase and add the index marks. Don't worry about page numbers' changing when the document is edited; these programs automatically update them.

It is useful to update and print indexes periodically as you add marked items, to ensure similar items are indexed in the same sequence. Printouts also help when you're deciding on names for new topics.

You might assume that all high-end word processors perform these tasks in a similar way. But there are surprising differences in how these programs work and in what they let you do with your TOC and index. Some of these differences are summarized in Table 1. If you know you'll have specific requirements for your TOC and index, make sure the program you're considering can handle them.

Directory

FullWrite Professional 1.1
Ashton-Tate Corp.
20101 Hamilton Ave.
Torrance, CA 90502-1319
(213) 329-8000
$395

Microsoft Word 4.0
Microsoft Corp.
16011 N.E. 36th Way
P.O. Box 97017
Redmond, WA 98073-9717
(206) 882-8080
$395

Nisus 2.03
Paragon Concepts, Inc.
990 Highland Drive, Suite 312
Solana Beach, CA 92075
(619) 481-1477
$395

WordPerfect Mac 1.03
WordPerfect Corp.
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(801) 225-5000
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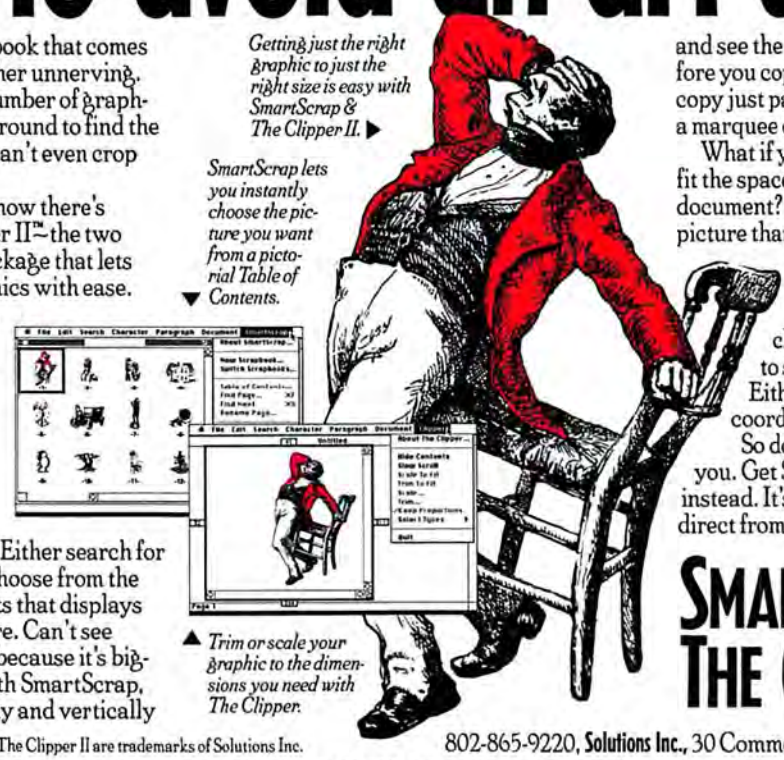
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MacUser Best New Desk Accessory 1987

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Table 1: Table of Contents and Indexing Features

	FullWrite 1.1	Nisus 2.03	Word 4.0	WordPerfect 1.03
TOC				
Uses markers	●	●	●	●
Marks existing text	○	●	●	●
Enters alternate text	●	○	●	○
Uses outline	●	○	●	○
Allows multiple TOCs	○	○	●	●
Auto-numbers chapters	●	●	○	○
Auto-indents subtopics	from outline only	with hidden tabs	●	●
Maintains text styles	●	○	○	○
INDEX				
Includes find-and-index feature	○	●	○	○
Merges indexes	○	by macro	○	○
Cross-references	○	●	● (no page number)	○
Number of sublevels	1	1 from outline	7	1
Maintains text styles	●	○	○	○
Handles page ranges	○	●	●	○
Index page numbers				
Places page number after text	○	●	●	●
Places page number tabbed	●	●	○	●
Labels sections	○	●	○	○



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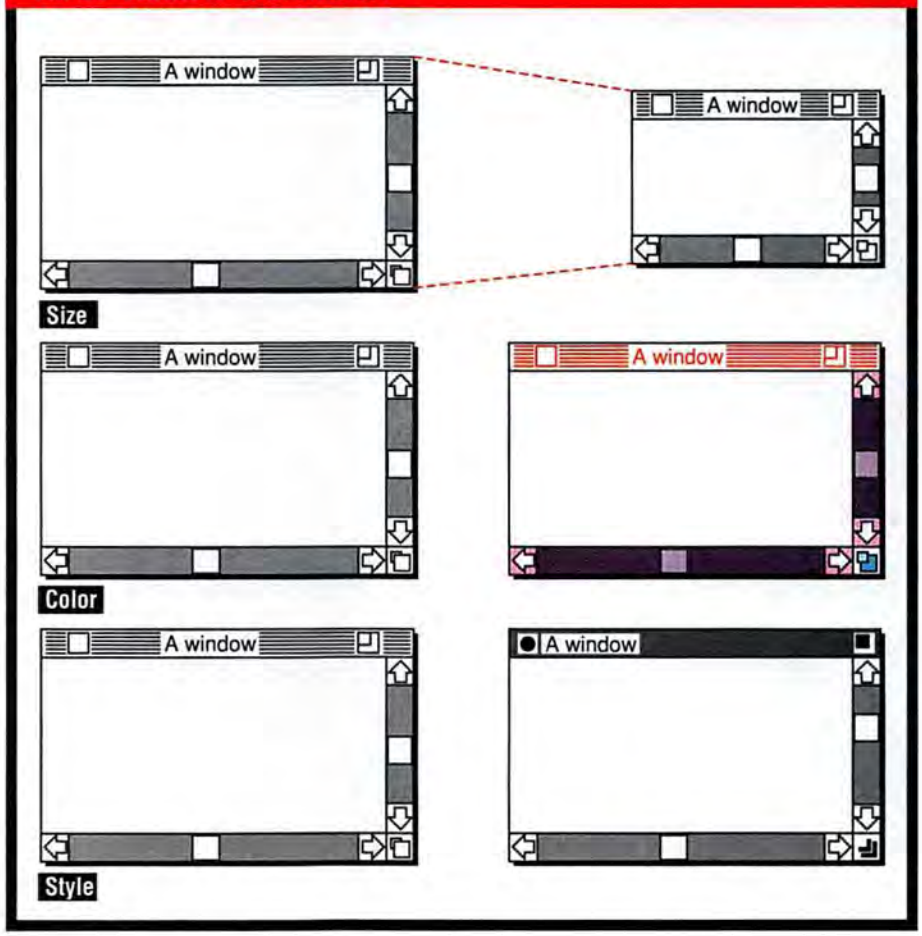
Windows of Opportunity

We view documents through windows and give little thought to the art of the glazier. But windows are not as transparent as they seem, and a little knowledge of their design and features can aid your mastery of the Mac.

Even after years of pioneering work by Douglas Engelbart at SRI and others at Xerox PARC, the developers of the Mac gave a lot of thought to such window-design issues as how scroll bars should work. The result was a set of standards for window structure, behavior, and appearance that application developers violate only at their peril, as Living Videotext discovered when it put nonstandard windows into its first release of ThinkTank in 1984.

Despite the standardization, you can customize your Mac windows and, by doing so, increase the usefulness of every dialog box, alert, DA, and application you work with.

Three Window Treatments



A Glass Menagerie

There are a whole bunch of different kinds of windows through which you can view your Mac documents. There are windows with and without drop shadows, windows with and without scroll bars, alert windows, active windows, and windows that are neither active nor alert. There are invisible windows and tinted windows and windows with panes. Figure 1 illustrates some, but not all, of the attributes that can make up a Mac window.

Window attributes not illustrated in Figure 1 include panes, panels, split bars, and specialized scroll boxes.

By Michael Swaine

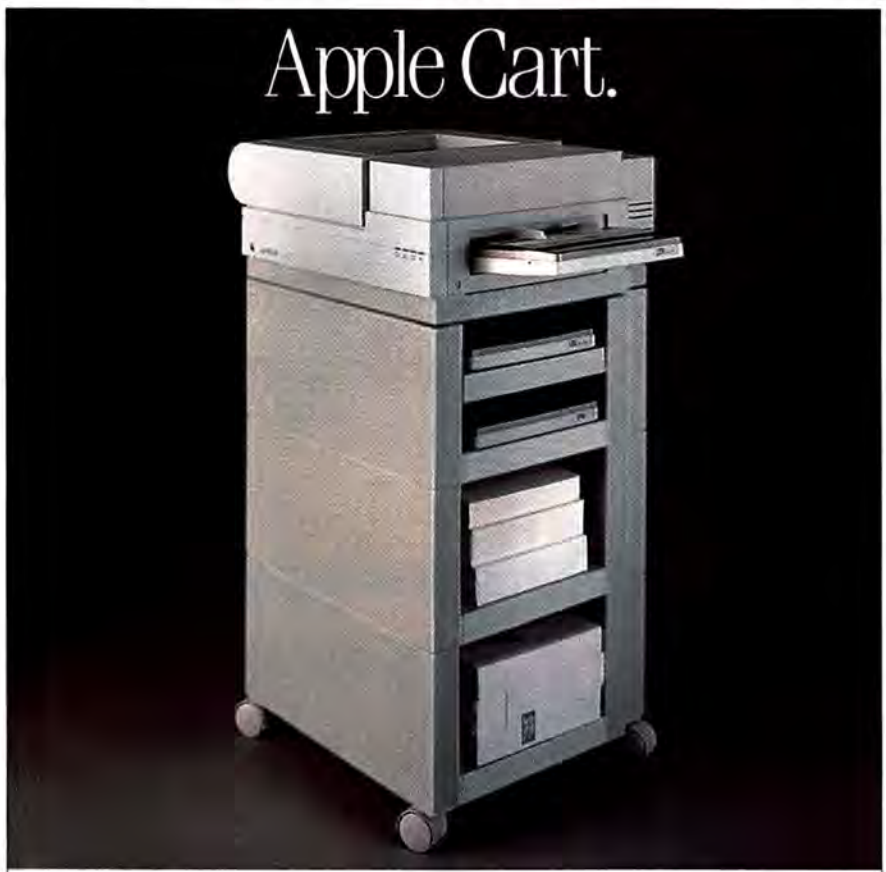
You'll find panes and split bars in Microsoft Word. The split bar is a small black area near the top of the vertical scroll bar. Dragging it down the scroll bar does two things: It splits the scroll bar into two fully equipped scroll bars, and it splits the window interior into two independently scrolling panes. The position of the split bar controls where in the document the split occurs. The Apple user interface guidelines permit windows to be split horizontally, vertically, or both at once. Application developers have not been quick to implement these features, nor have they picked up on panels, which are relatively permanent panes, defined for different types of views of the same document.

Some applications customize the scroll box

The Layout utility lets you specify a new default size for windows, along with many other attributes. The Colorize cdev allows you to choose window colors. And this NeXT-influenced design came from WindChooser.

by placing the current page number there, which Apple approves of. Apple also approves of proportional scroll boxes, which change size to show the amount of the file that is visible.

In addition to the components, Apple also standardizes the behavior of windows, such as moving, sizing, scrolling, zooming, opening, and closing. There are some recommended connections among these behaviors: If a window can be moved, Apple recommends that it also be resizable. If it's resizable, it probably should also be scrollable. Zooming is handy but available only to those with certain ROMs: The zoom box toggles between a standard size and position and a user-selected size and position. You select the size and position by manually resizing or moving the window. A little tip: You can drag-resize a window up to seven pixels without changing the user-selected state — to peek under its corner, say.



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A little tip: You can drag-resize a window up to seven pixels without changing the user-selected state.

One window — the one on which your actions take effect — is called the active window. Normally you make a window active by clicking on it, but this can be awkward if you have many windows open. Several tools let you get around this problem: The Windows cdev puts a menu of open windows to choose from in the menu bar, the WindowList INIT pops up a similar list of open windows below the title bar of the active window, the Send Window to Rear Fkey lets you push the active window out of the way, the Blast It and Holey Fkeys make the content region of windows transparent so you can see what's behind them, and the WindowShade cdev hides most of the active window behind its title bar.

You can modify many of these features. Michael O'Connor's free Layout utility (currently in version 1.9) lets you turn the visual zoom effect on or off, turn the title-bar click (which brings a window's parent window forward when you click on the window's title bar) on or off, or set the maximum number of windows displayable (for more on Layout, see this month's Help Folder).

Other utilities that affect the features or behavior of windows include the CloseWindow Fkey, which closes the active window; infiDrag, which allows you to drag windows off the screen (some applications limit drags); and Scroll2

(currently in version 2.0), which puts double scroll arrows into the scroll bars. Scroll2's arrows let you move in either direction from either end of the scroll bar and are particularly convenient.

Window Dressing

But you say you really just want to make your desktop look like that of a NeXT machine? That would be frivolous, but there are ways to alter the appearance of windows on your desktop. I often create folders to hold just a few documents, representing stages or components of a project, and I like to keep the windows for these folders small, smaller than the default window size. So I redefined the default, and while I was at it, I redefined the default view and the maximum number of windows I can have open at one time. Layout does all these things, and it lets you set the spacing of icons in windows and alter a few other window characteristics.

You can also color the individual elements of a window, such as the scroll box and the title bar.

There are a few utilities that modify the appearance of windows, including several that affect color. The Colorize cdev lets you customize virtually every element of windows, both for the Finder and for individual applications. WindChooser is a cdev that lets you select among various window styles, substituting for the system WDEF resource one of its own. You can have SmallTalk-like windows, shrinkable windows, or even NeXT-like windows.

Power Windows

Then, for the hardy and the foolhardy, there is direct manipulation of windows resources by means of ResEdit. Here, with the familiar caveat that you should work only on copies of files when you use ResEdit, are the basic facts: The resource type for a window

Ten Little Arrows

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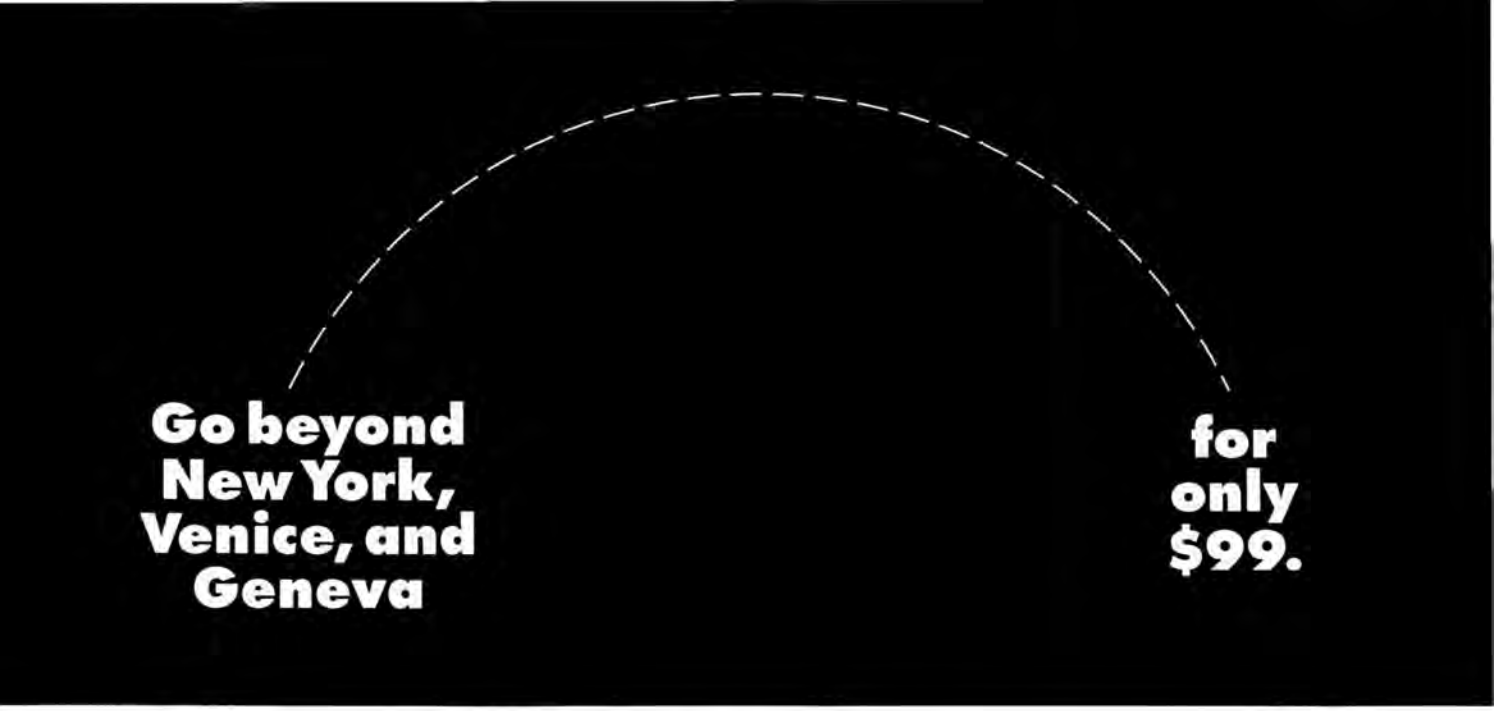
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Figure 1: Window Parts

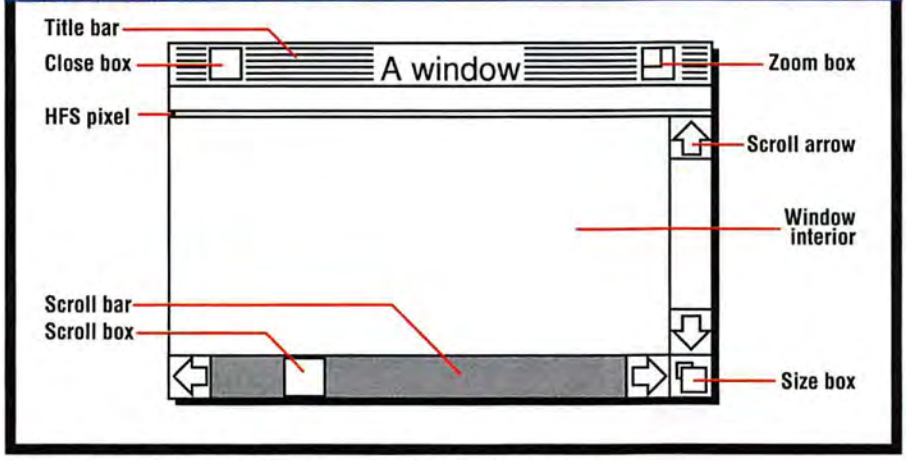


Figure 1: Some, but not all, of the basic attributes of a Mac window

You can alter the appearance of windows on your desktop in many ways. One of the most useful programs for this is the free utility Layout.

template is WIND, and its data format is defined in *Inside Macintosh*, as is the window-record data structure, WDEF. The wctb resources you find in some applications control window color. You can't really do much with any of these resources except substitute other resources of the same type, although you can edit the color specifications in wctb resources. But Colorize is a much better and far more convenient (and safe) tool for that job.

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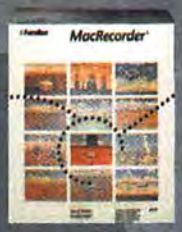
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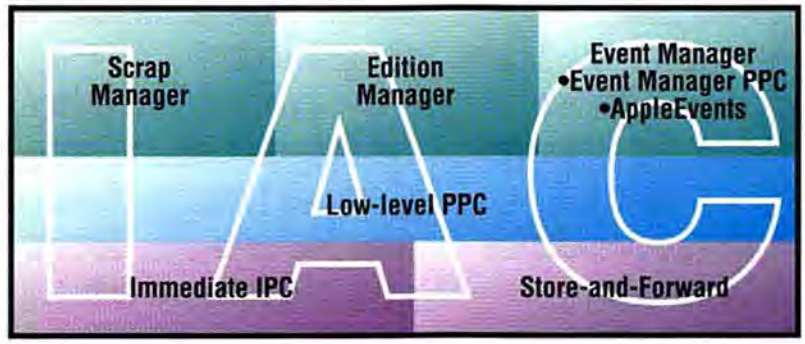
System 7 Watch: A Communication Annotation

One of the core technologies in version 7 of Apple's system software is IAC (Interapplication Communication). Its promise is a new generation of programs that communicate and cooperate with one another in a kind of desktop *glasnost*. Here's a look at the components of IAC and what they may mean to you.

The **Scrap Manager** maintains the Clipboard, handling copy/paste operations on PICT and TEXT data. You have it now, and you'll still need it under System 7. The Edition Manager will provide new "live" copy and paste, but you'll still need the dead kind for existing applications.

Low-level Program-to-Program Communication is the set of system-software tools with which the higher-level managers Scrap Manager, Edition Manager, and Event Manager PPC are implemented. It in turn uses the lower-level tools in Immediate IPC and Store-and-Forward. You won't have any direct interaction with it, although you may have interaction with it that is not mediated by the higher-level managers. This will happen when vendors create communication strategies based on direct low-level PPC calls, which they will do for speed and precise control. Developers will be responsible for the interface, so there's no telling what it will look like. Since Apple is providing no protocols at this lower level, cooperation among vendors is less likely here. Vendors might use this level to produce specialized protocols that allow their own products to communicate better among themselves than with their competitors' products. It will take more work to create communication at this level, so applications using this kind of communication won't come quickly. DAs, however, will have to tie in at this level.

The **Edition Manager** will support "live" copy and paste, a dynamic copy/paste technique in which alterations in the original are automatically reflected in the copy. The Edition Manager will understand the same formats as the Scrap Manager does. You'll encounter it, in applications that support it, as two new menu items: Publish and Subscribe. You can "publish" a section of your document, controlling who has access to it, and you can "subscribe" to publications, deciding whether you want the updating to be automatic or manual, controlled by you. This capability is likely to become widespread fast, and not just because Apple is promising developers a whole new market based on this tool alone: groupware.



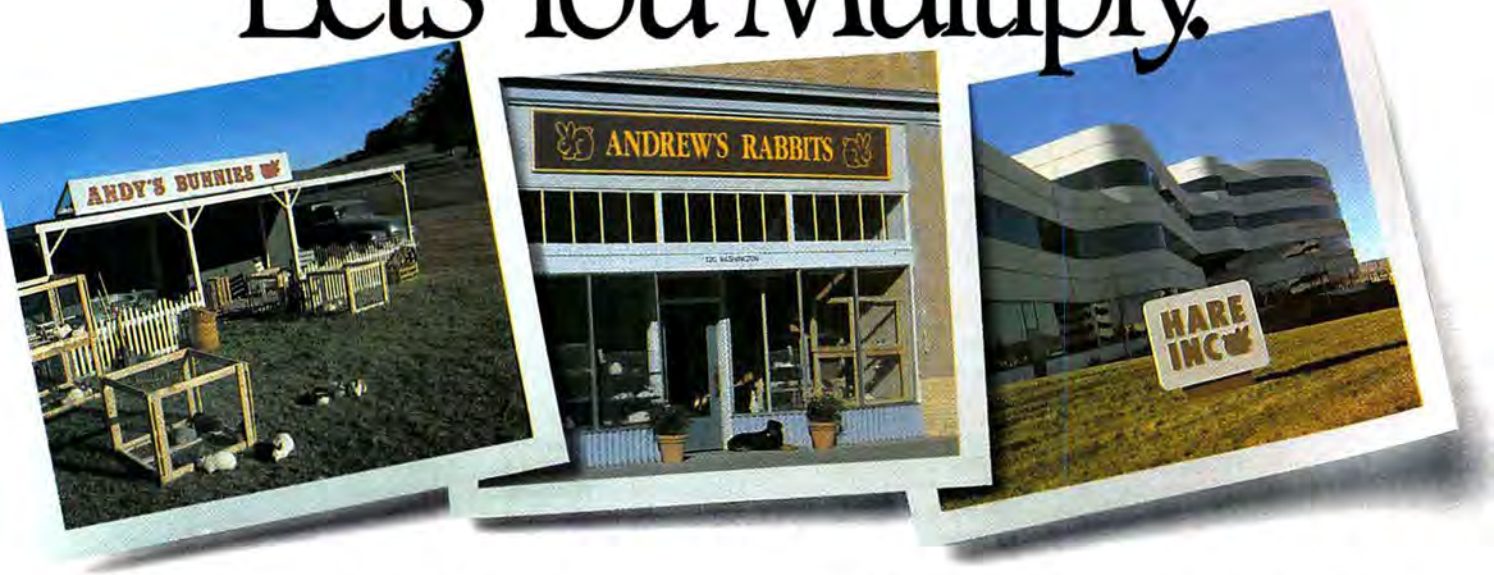
The **Immediate IPC** routines will handle interprogram communication of the conventional kind, in contrast to the deferred communication of Store-and-Forward. A program might be written to use Immediate IPC if possible and to use Store-and-Forward otherwise.

The **Event Manager PPC** will manage the sending of messages between applications, unlike the other top-level managers, which will send data. This will be the primary method of communication between applications; rather than one application's driving another, the applications will engage in a dialogue to get the job done cooperatively. For example, a word-processing program might request a particular computation from a spreadsheet program. This cooperation among applications will require cooperation among vendors, which Apple is facilitating with the AppleEvents protocols. It will also require rewriting of applications, so it will take some time.

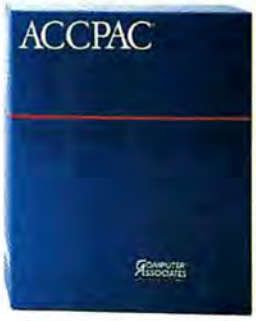
The **Store-and-Forward** routines will allow sending of data to applications that are not currently running. This capability will work across networks and be available to all the higher levels, particularly to live copy and paste. Apple compares it to a telephone-answering machine. Using Store-and-Forward, one application can message another to update a complex computation as soon as it becomes available and to publish the result.

AppleEvents is the name for a set of messages for interprogram communication. Apple is defining a standard set of messages, such as Open File, to which all programs should be able to respond. Applications supporting AppleEvents should come fairly quickly, since Apple is pushing hard, and the payback to developers will be high, because of Apple's support and standardization. Application developers have two things to consider when dealing with AppleEvents: The application should respond appropriately to all relevant AppleEvents messages. (This can mean anything from merely acknowledging the message and doing nothing to launching into a lengthy dialogue with the sending application, exchanging permissions, passwords, and data.) Then there's the possibility of having the application send AppleEvents messages. When the application responds, it is likely to be transparent to you within the application, since it will be invoked from outside. You will control the sending of AppleEvents messages, but the user interface is up to the individual vendor and may involve anything from new menu items (Compute, Encrypt) to a user scripting language. Apple is referring to AppleEvents as "the enabling technology" for user scripting language, and we may see not one such language but several of them.

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THE EXPERT'S EDGE

Font Basics and Beyond

To use or not to use ATM — that's only one question. Also consider your RAM, hard-disk capacity, and type styles.

By Thom Hogan

You're probably pretty tired of being bombarded with article after article reporting on the font wars going on between Apple and Adobe. You know, the old discussion of PostScript versus TrueType (previously code-named Royal). Well, a lot of good all those stories are doing you. Here it is midsummer, and there's still no sign of Apple's System 7, which will be the first System version to contain TrueType. Nope, all that hoopla over fonts hasn't done you a bit of good, since you're still struggling to get by with what you have.

Fortunately for you, I'm going to set out the basics you need to know regarding font use on a Mac. Here goes:

The Basics

Let's get you folks who are still using an ancient, yet acceptable, technology out of the way first. If the only printer your documents ever see is an ImageWriter, life is pretty simple: (1) Pick out the sizes of bit-mapped fonts you want, and make sure they're installed in your System file, using Font/DA Mover 3.8 (or install them with Suitcase II or Master Juggler). (2) For ImageWriter I and II printers, make sure you have also installed font sizes two times larger than what you normally use in your documents (if you normally work with 12-point type, for example, install 24-point type); for ImageWriter LQ printers, you should install font sizes three times larger than what you normally use (36 point if your text is 12 point). (3) Avoid italic, outline, and shadow styles when possible, since they are usually derived from the bit maps installed in the System file and don't always translate into effective styles in the printout. (4) Stick with the basic sizes: 10, 12, 18, and 24 point. In fact, use as few sizes as possible, since the installation of bit maps in the System file consumes precious memory.

If you're an ImageWriter owner, you can pretty much ignore Adobe Type Manager (ATM), since it really doesn't offer you much. Type larger than 24 point can benefit from ATM's type handling, but normal 10- and 12-point type doesn't gain anything (indeed, some of us think it loses something). And ATM gobbles up memory to do its thing (a font cache of 256K or more is recommended), so you very definitely don't get something for nothing. If you're looking for better-looking normal type, you're probably better off checking out the alternative fonts that have appeared over the years (Boston, Santa Barbara, and my own Palo Alto come to mind), since they were optimized specifically for ImageWriter printers. Better still, all these ImageWriter fonts are either public-domain or low-cost (I'll send you a disk of my ImageWriter fonts for $10 — see offer #1 at the end of this column).

That's it. If you're worrying only about printing on an ImageWriter, life is that simple. But throw in a higher-quality printer, and things start to get more complicated and you'll have to be much more sophisticated in how you install, manage, and use fonts.

Helpful Hints for Managing Fonts



ImageWriters

- Avoid ATM.
- Install in System all sizes of all fonts you will use.
- Install 2x or 3x sizes, depending on printer type.
- Avoid italic, outline, and shadow styles.
- Use as few fonts as possible.



Non-PostScript 300-dpi printers

- Use ATM.
- Assign a large font cache, if possible.
- Install in System at least 10- and 12-point standard roman font.
- Use Suitcase or Master Juggler.
- Avoid Type 3 fonts.



PostScript printers

- Use ATM.
- Assign a large font cache, if possible.
- Install in System at least 10- and 12-point standard roman font.
- Put all PostScript font files into System Folder.
- Avoid bit-mapped fonts — particularly Geneva, New York, and Chicago.
- Use Suitcase or Master Juggler.

One Cut Above

The next step up from an ImageWriter is a 300-dpi non-PostScript printer, such as the Apple LaserWriter IISC, the GCC Personal Laser Printer, and the Hewlett-Packard DeskWriter (I've listed these in order of my least

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If you don't have enough memory to assign a reasonable-sized cache, buy more memory. Believe me, it's worth it.

favorite to most favorite; curiously, their prices go in the opposite direction — the HP is the least costly).

You can follow the instructions that come with these printers regarding fonts, but I strongly suggest that you don't. Apple suggests using bit-mapped fonts with the IISC, just as with the ImageWriter. You'll either end up with oodles of memory wasted with installed fonts, or you'll severely limit your possibilities, which doesn't seem right. If you're going to spend a couple thousand for a printer, it ought to be able to do much more than a basic ImageWriter, right? HP provides three basic fonts with its DeskWriter (equivalents to Helvetica, Courier, and Times) and offers an additional library of fonts for several hundred dollars. But HP's font designs, with perhaps the exception of theTimes rendition, are decidedly inferior to lower-cost alternatives.

Yep, I'm about to recommend Adobe Type Manager and the companion Type Package #1. If you've got one of these high-resolution printers, you might as well let it do its thing, and I can't think of a better way of rendering fonts at 300 dpi than using ATM. And if you ever rotate text, employing ATM is absolutely better than the bit-map method Apple suggests and uses.

Let me give you some hints on using ATM: (1) Assign as much memory as you can afford to the font cache — 512K is good; 1,024K is excellent. The larger the font cache, the less time your system will spend rebuilding fonts on the fly. If you don't have enough memory to assign a reasonable-sized cache, buy more memory! Believe me, it's worth it. (2) Get a good utility, such as INITPicker or Aask, that allows you to quickly disable ATM on startup, should you so desire (and believe me, there will be times when you'll want to, especially if you've assigned a large font cache). (3) Because of step 2, either install a full set of font sizes in the System file (not simply the 10- and 12-point sizes of standard roman style, as Adobe recommends) or invest in Suitcase II or Master Juggler so you can still have a decent set of fonts available. (4) Consider adding an accelerator to your computer or upgrading to a faster machine. ATM builds fonts on the fly, and there is a noticeable delay on slower machines. The delay depends partly on cache size, partly on the font you've selected, and partly on the font size you've asked for. Generally, the bigger and more complex the font, the longer the delay. The more font styles you have in your document, the more likely it is that your font cache will get filled, resulting in additional delays as you type new text.

If you decide to go whole hog and buy ATM-capable fonts beyond the few that come with ATM, I'd again point you to Suitcase II or Master Juggler. The reason? Unless you want to end up with hundreds of "printer font" files in your System Folder, your only recourse is to use Suitcase or Master Juggler. Every ATM-capable font comes with a separate printer font for each style (plain, bold, italic, bold-italic, and so on), so the printer-font files multiply like weeds as you add fonts. To use Suitcase or Master Juggler to find your printer fonts, you must open at least one screen font (Font/DA Mover file) in the same folder that contains the printer fonts. If you're like me, you'll just go ahead and put all your fonts except Chicago and Geneva into a separate folder and always install them by using Master Juggler (my choice of the two). Chicago and Geneva are *default* fonts used by the System for numerous chores, such as menu choices, dialog text, filenames, and so on — you must have them installed on your machine unless you have a Mac II, which includes them in ROM. But there's no real penalty for keeping Chicago 12 and Geneva 10 installed in your System, since they don't take up much memory.

Something to watch out for during these times of transition: Type 1 versus Type 3 fonts. Only Type 1 fonts work with ATM. All Adobe-packaged fonts are Type 1, but unfortunately, most third-party fonts available are still Type 3 fonts, since the program that created them (usually Altsys' wonderful Fontographer) is only capable of generating Type 3. Fortunately, conversion programs are becoming available and this problem is going away. In the meantime, be careful to purchase only Type 1 fonts if you think you're going to use ATM.

What's the difference between Type 1 and Type 3? Well, until late 1989, Adobe reserved Type 1 for its own fonts. There were two principal reasons behind keeping Type 1 secret: Early on, Type 1 fonts were always copy-protected (heaven help you if your laser printer burped and needed to have new copies downloaded) and Type 1 fonts included proprietary "hinting" information that improved the appearance of Adobe's fonts at sizes of less than 12 points. If Apple's announcement that it was going to provide its own font mechanism did anything, it broke down Adobe's you-can't-have-it-because-it's-mine attitude. Now Adobe publishes the Type 1 specifications, and any font company can use them.

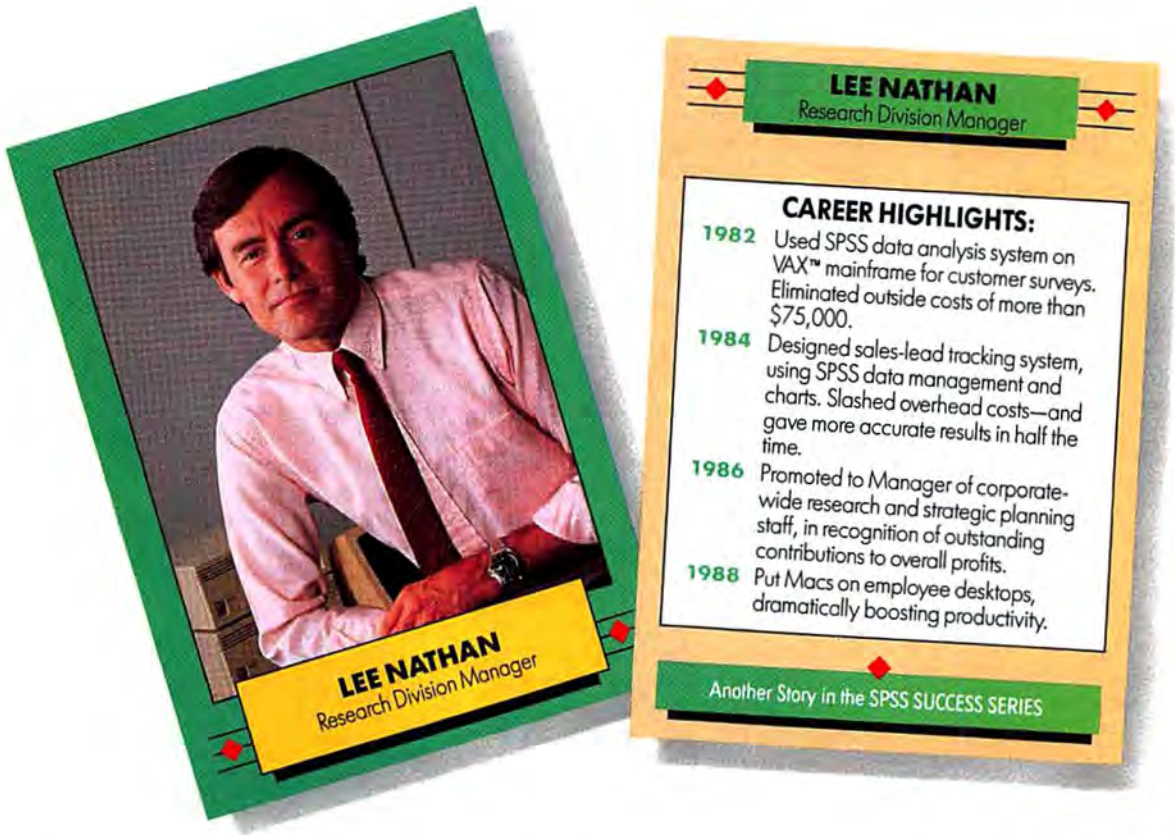
Another hint about using ATM: Avoid unnecessary font changes. Stick to one or two basic fonts, in one or two sizes.



Only Type 1 fonts work with ATM. Until more conversion programs are available, buy only Type 1 fonts if you think you'll use ATM.

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Avoid italics and boldface, if possible (underline is much faster). My newsletter, for example, uses only five font variants, and no one's complained about its drabness. By sticking to only a few styles and sizes, you'll keep ATM's font building (and thus delays) to a minimum, especially if you've followed my other suggestions.

PostScript über Alles

If you have a PostScript-equipped printer, congratulations. Now comes the tough part. You have a choice: You can simply use the printer and its fonts as they come, or you can try to squeeze every last ounce of typographic quality out of the machine. Nobody ever told you that you had a choice, did they?

Let's take the subject of kerning, for example. Type kerning, in the traditional definition, is the ability to adjust spacing between pairs of adjacent letters. In predigital days, kerning involved the creation of special letter pairs. Besides having the letters *T* and *H*, a font often also had type slugs for *TH* and *To* and *Te*, for example. Indeed, because of its overhang, the capital *T* was often kerned with most other letters. If the typesetter forgot to use the proper slug and used regular letters, no kerning could take place, since the type slugs abutted one another — there was no space there that *could* be removed.

Computerized typesetting changed all that — it can automatically adjust adjacent pairs based on information that the user provides. Most large publications and typesetters have built digital catalogs of letter-pair adjustments. Having 300 or more kerning-pair combinations is commonplace; many typesetters have thousands.

Kerning is different from "tracking," or interletter spacing, which many word-processing and page-layout programs use to adjust justified text. Since all the characters in most typefaces can be different widths and there's no way of predicting which characters will be in a line, the only way to properly justify text (align both the right and the left margins) is to vary the spacing between words and between characters. If the line is going to be a little too long, the program deletes an equal bit of space between all the characters in the line. If the line is going to be too short, it adds equal bits of space between the characters.

PostScript can handle kerned text, and



My suggestion: Ask what kerning software your typesetting service uses, and buy it.

many programs now available automatically use its full potential. The problem with manual kerning is that it takes time. First, you need to identify and set standards for kerning pairs. Most Adobe and other professional fonts come with a bare minimum of kerning pairs (generally fewer than 300). You want to create appropriate kerning pairs only once with each font, but be prepared to spend many, many hours accomplishing this. I haven't tried all the kerning software that's available, so I can't really recommend one program. My suggestion is this: Ask the folks at your typesetting service what they use, and buy it.

Once you've identified and adjusted the pairs, kerning still takes extra time, since printing now slows down significantly. One simple example I tried resulted in a difference of three minutes on a single page of text. Still thinking about using kerning in that 30-page report you just wrote? Interletter spacing takes some time during printing too, but not as much as true kerning does.

But wait — there's more. Consider the following word: FITTING. In some fonts, the top stroke of the capital *T* is wide enough to cause major problems — you end up with big gaps of white space between the vertical bars of the *I*'s and the *T*'s. Kerning doesn't help in this situation, since bringing the vertical bars closer together results in the top of the *T*'s overlapping each other and the adjacent letters. What do you do here?

Well, until recently, you did nothing. Fortunately, everything comes to those who wait. Three new type-handling products that have come across my desk lately can help you solve problems such as the gaps in the ITTI. Two of them, Type Styler and TypeAlign, are close competitors. I'll describe what TypeStyler can do, since I believe it to be the superior product in general — it has more features, more output options, and a better manual, and it comes with several nice out-of-the-ordinary fonts to play with (for more, see offer #2 at the end of this column).

For our recalcitrant ITTI combo, we could do the following with TypeStyler: let the characters overlap and control the way the overlap is handled (that is, the order in which the characters print), use the kerning tools to adjust the spacing of these characters, or play games with the font itself by creating a smaller *T* (essentially condensing the width of the font). If it were a perfect world, Broderbund would have added vertical and horizontal Expand and Contract functions to the product, but instead, we have to use our head to accomplish the same thing. And of course, we can add color, make the text follow a curved line, and add a host of other effects at the same time.

Personally, as good as TypeStyler is, I wouldn't use it to solve the ITTI problem. Instead, I'd take care of it in the same way I did in the olden days before computers: just chop some of the stop stroke off the capital *T*'s. Just how in the heck do you do that? Well, until Altsys' new program Metamorphosis appeared, you didn't. With the combination of Metamorphosis and Fontographer, however, I can now modify existing fonts pretty much to my heart's content. It's a simple matter of using Metamorphosis to create outline information from the installed font and then bringing those outlines into Fontographer and changing them. In the case of the capital *T*, I'd copy the *T* to another character I don't use (such as †, which happens to be Option-T), edit the outline so the horizontal bars are half the width of those in the regular *T*, compile and install my new font, and then go back to my document and substitute a † for the *T* in my problem word.

Indeed, Metamorphosis is a perfect tool for people who create type for logos, corporate identity campaigns, and the like. I remember spending weeks refining the typeface for the title of a magazine I helped redesign. We took a standard Folio font and then started trying little

FONT-LOOSE

& fancy-free



Bauhaus Heavy ITC Kabel Ultra Futura Extra Black
chen Revue Franklin Gothic Condensed Bodoni Poster
s Medium MACHINE Folio Extra Bold ITC Kabel Bold
Bookman Light Linotype Centennial Belwe Bold
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Kabel Helvetica Condensed Eras Light Freestyle
enir Futura Light Bauhaus
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f Chancery University Optima
IGNOT LIGHT

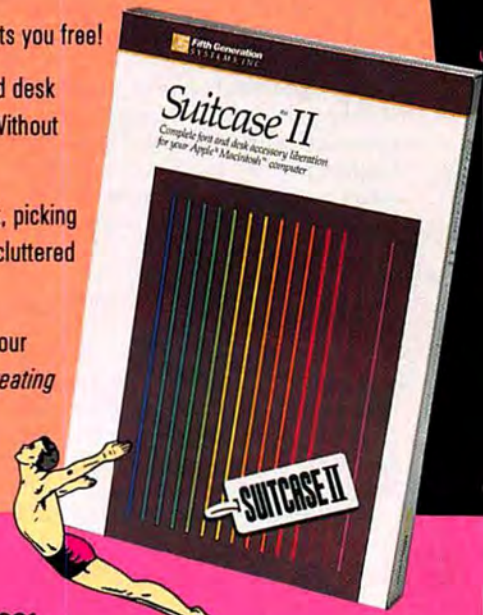
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touches in an attempt to make it look slightly more distinctive. After many painful hours of drawing and cutting, we ended up making only three changes to the basic font: We cut back all the letters that previously connected to the vertical bar in the center, so they didn't quite meet the bar; we created a special FT ligature to overcome the kerning problem that this pair created; and we designed a distinctive *W*, for reasons I don't remember. If Metamorphosis had been around then, it would have taken far less time to create this new font. Moreover, when we were done, we would have had a font that could have been typed in just like any other Mac font (instead, we recreated the special font every time we needed it in a new size).

All of which brings me to one last point about using PostScript fonts: Pay lots of attention to your headlines and large type and less attention to body text. Generally speaking, QuarkXPress, PageMaker, Word, and the like do a good job on text all by themselves. If we're talking about five pages of 10-point text on 11-point leading, most readers are never going to notice small kerning problems that might arise if you use these program's defaults. But if you've got a 30-point boldface headline with a problem, readers will notice.

All of which brings me to one last point about using PostScript fonts: Pay lots of attention to your headlines and larger type and less attention to body text.

It's the old 80/20 rule in another form: Spend 80 percent of your fine-tuning time on the 20 percent of the text that is the most noticeable. Spend the remaining 20 percent of your time fixing the most glaring problems in the other 80 percent of your text.

Do You Want to Play?

Finally, here are two offers for those of you who want to play with fonts: (1) For $10, you can have a disk crammed full of bit-mapped fonts optimized for ImageWriter printout — call (800) 952-6300, and ask for Department 77a. (2) A disk containing three distinctively different PostScript fonts and the source files used to create them can be yours for $10. If you've got Fontographer, you'll have a good starting point for creating new fonts. Call (800) 952-6300, and ask for Department 77b.

Thom Hogan is president of Macreations and editor of the monthly newsletter *The Macintosh II Report*. For a sample copy, send $2 to Macreations, 329 Horizon Way, Pacifica, CA 94044.

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Scroll Your Own

Scrolling windows are a key interface element, but don't look for them in the Toolbox.

A colleague of ours wanted to add scroll bars to his application, so he called and asked what routine enabled the scroll bars in a window. He assumed that scrolling was a function supported by the Toolbox and that once you put the scroll bars in the window, scrolling followed.

Much to his disappointment, it doesn't work that way. Although the scroll-bar controls are drawn by the Control Manager, and a QuickDraw procedure exists for pixel-scrolling an arbitrary rectangle, it's the application's job to place the window contents so that the data seems to move under the stationary window. And this is no small job!

If you're a first-time reader, you've just walked into the third installment of a three-month tour of our Generic App — "the only program you'll ever need." Our original intention for this month's column was to cover Generic in greater detail. We had also planned to start you on the way to doing your own enhancements: adding scroll bars, a window menu, and other things. Instead, we've decided to devote the entire column to Mac scrolling mechanics.

When you write a column such as this one, you need to read around and see what's already been done and keep an eye out for holes in the coverage. We've discovered a gaping hole in the Mac programming literature regarding scrolling, and we wonder why it exists. Perhaps it's because of the close association of scrolling techniques and document display. Because most authors tend to follow the lead of *Inside Macintosh* and organize their works to correspond to the Toolbox managers (if you read our last column, you know that we're also guilty of this), an interdisciplinary topic such as scrolling falls through the cracks. The result is that all new developers have to discover the technique for themselves. So, in keeping with the charter of this column, we'd like to cover this topic once and for all. This month we'll use Generic App to show you how to scroll both text and graphics documents.

Figure 1: The Window Frame

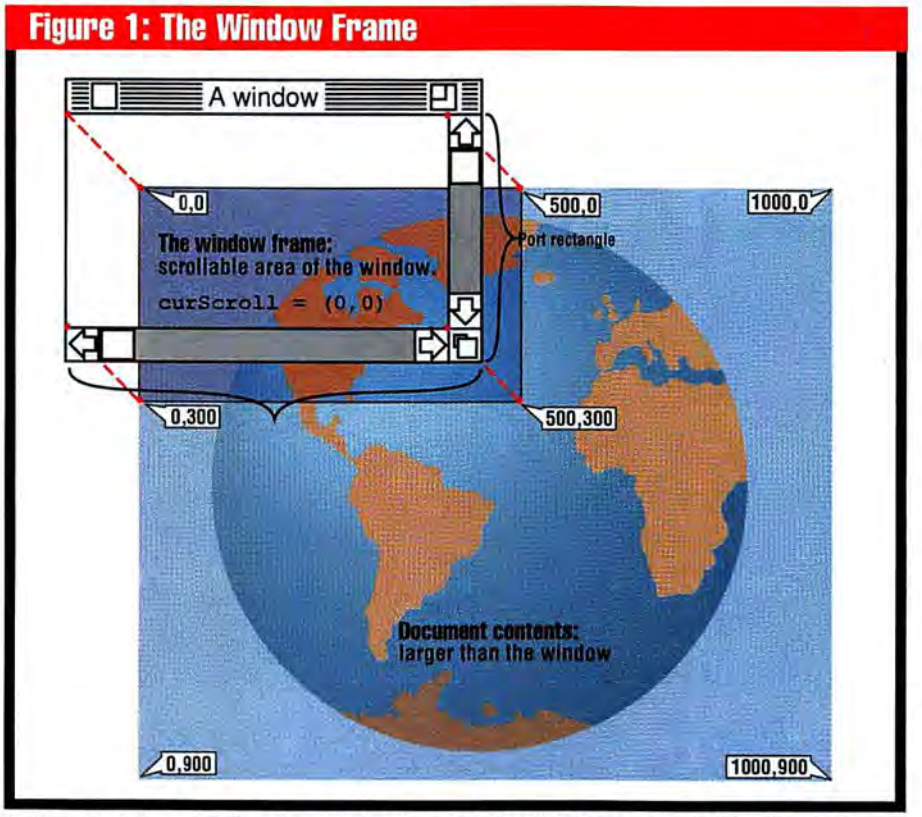


Figure 1: A window provides a view into the document. Scrolling is necessary to bring the window frame to all areas of the document contents. Note the QuickDraw coordinates.

Fundamentals of Scrolling

A good place to start is with the document's content rectangle, which we call the window *frame*. The frame is where the document is displayed. Generic's primitive `makeFrameRect()` calculates this rectangle by first getting the port rectangle (see Figure 1) and then subtracting the width and height of the scroll bars from the right and bottom sides. Incidentally, a vertical scroll bar is 16 pixels wide and a horizontal scroll bar is 16 pixels high. Although there's no system constant that defines these dimensions, this fact is mentioned somewhere

By Kurt W. G. Matthies and Thom Hogan

in *Inside Macintosh*. So we've defined our own constant, **kScrollBarSize**. It's always a good idea to use defined constants instead of raw numbers: It not only makes the code more readable, but it can also help you years later when you are making changes, a long time after you have forgotten why 16 is subtracted from **frameRect.bottom**.

Another important dimension is the maximum size, in pixels, of the area the document's contents will occupy. We call this the document *extent*. In some cases, the document extent is known or can be calculated, as with a PICT file; in others, such as large text files, the best you can get without processing the entire file is an estimate. Either way, you must know the horizontal and vertical extents of your document in order to set the control maximum and thumb position of the scroll bar (see Figure 3). Figure 1, which shows an unscrolled document, illustrates the relationship of these quantities to each other.

Figure 2: After a Scroll

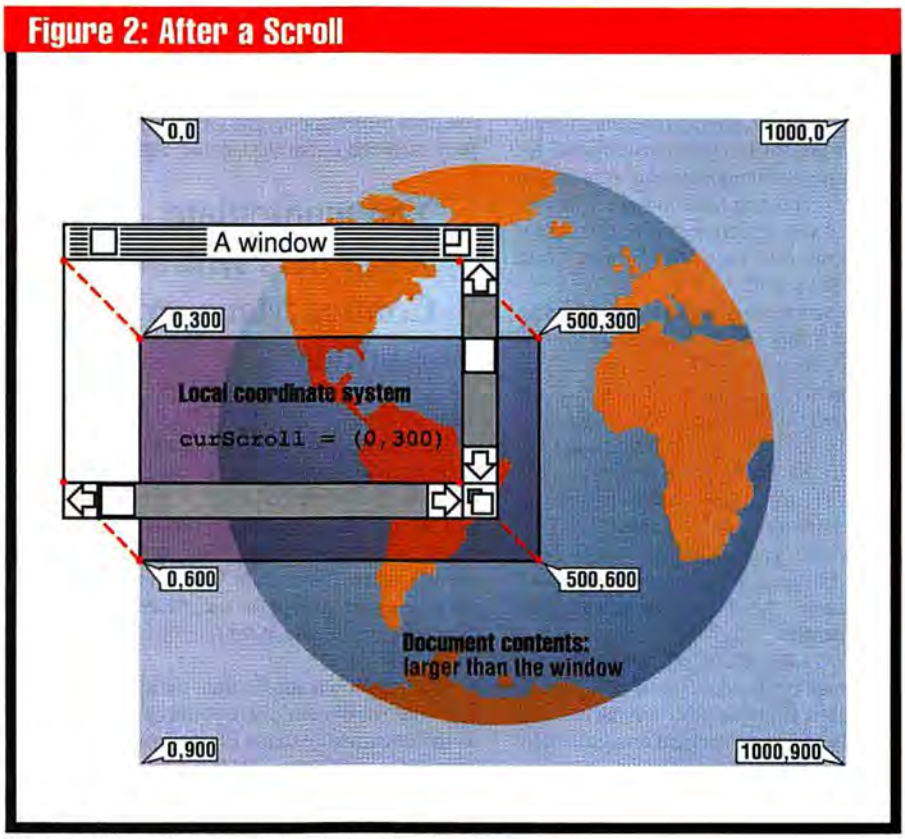


Figure 2: The scrolled document is displayed in the window.

Figure 2 shows the relative "movement" of the document contents within the frame after a scroll. An important aspect of scrolling is displaying the area of interest in the document within the window frame.

In the latter two figures, we've marked the corners of the document extent and window frame. These locations are in the window's local coordinate system, and the relative position of the contents is managed as an offset of the document relative to the window frame's origin, shown in Figures 1 and 2 as **curScroll**. In a way, scrolling is much like imposing yet another coordinate system on top of the local system. Remember, we have global coordinates — a base coordinate system that is used primarily to locate a window on the screen. Imposed on top of the global system is the window's local coordinate system, with its origin at the upper left corner of the window's content region (not at the upper left corner of the window, where it was misplaced in our April '90 installment [page 245]—we're still blushing!). Instead of adding a third coordinate system for the scrolled document, it's simpler to maintain an offset, or current scroll position, for the window.

Of course, when we say an offset, we are really talking about values in both the horizontal and vertical directions, since you can usually scroll either way. **Point** is the data structure of choice for each of these variables. For those unfamiliar with QuickDraw, a **Point** is defined as

```
typedef struct {
  short  v, h;
} Point;
```

The current scroll is the pixel offset of the document due to scrolling. The value of the current scroll is adjusted whenever the user clicks in a scroll bar. Both the horizontal and vertical current scroll values range from 0 to the maximum scroll in each direction. The thumb of the scroll bar depicts the current scroll position relative to the maximum scroll.

The maximum scroll is the total travel distance required to view the entire document. This value is not the document extent, as you might have guessed. But the extent is part of the calculation:

```
maxScroll.h = docExtent.h -
  frameWidth;
maxScroll.v = docExtent.v -
  frameHeight;
```

frameWidth and **frameHeight** are simply the width and height of the frame rectangle. And if you've ever wondered how to get the width of a rectangle, the formula is as follows:

```
width = rect.right -
  rect.left;
```

We'll leave the formula for calculating the height as an exercise for readers.

Figure 3: The Scroll Bar

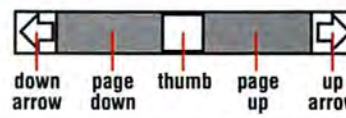


Figure 3: A scroll-bar control consists of five parts: up arrow, down arrow, page up, page down, and thumb.

The Document and Its Contents

The document is the central data structure for Generic's windows. We've modified the function **createNewDoc()**, which has been Generic's document-creation utility for the past two months, for the purpose of demonstrating scrolling in both text and graphic windows. The File menu's New selection is now a hierarchical menu with items for both text and PICT documents.

We've modified **createNewDoc()** so that it forks on the document type to create a text or PICT document. Each document is tagged with a bit in the **flags** field of the **Doc** data structure to identify its type, thus binding the contents to the document and making you think in terms of the contents before you do certain things to a document.

Because your documents now have different types, your rendering function, for example, needs to know what type of document it is drawing. Generic uses a macro, **ISPICTDOC**, to determine the document type and then acts accordingly in various strategic places in the code — namely, during document creation, deletion, and rendering.

In creating the document, the issue is: What do you put into the window? The graphic document is loaded from a PICT resource, created with a drawing program, and written to the project's resource file with ResEdit. For today's example, we chose a picture that we knew would be larger than a window (although if you're using a full-page display, it might not be). The Toolbox utility **GetPicture** loads the resource into RAM and returns a handle to the data structure, as in the call

```
picHdl =
  GetPicture (kDocPictID);
```

The picture handle is kept in the **contentHdl** field of the **Doc** structure during the life of the window. Generic relies on the picture frame — a rectangle that defines the extent of the PICT resource and is part of the **PicHandle** data structure — for the document extent. Generic obtains the extent in the following expression:

```
extent =
  (*picHdl)->picFrame;
```

The text document contains text data in the TextEdit data structure **TERec**. In the bottom fork of **doNewDoc()**, a TEXT resource is read into RAM by the use of **GetResource**, the general-purpose Resource Manager routine. Here, Generic uses some TextEdit routines to create a **TERec** structure and load the text. Generic then calculates the document's vertical extent by multiplying the number of text lines by the line height; Generic finds both of these quantities in the **TERec** data structure.

> You manipulate scroll bars with Control Manager routines.

The scrolling values — **docExtent**, **curScroll**, **maxScroll**, and soon-to-be-mentioned **scrollVal** — are also document-related quantities and are kept in the **Doc** data structure. They are calculated when the data is bound to the document and, except for **curScroll**, they are never changed for the life of the document.

In a full-blown application, these values would be dynamic and would change as the document extents of the window changed.

Scrolling and the Scroll Value

The scroll value is document-type specific and defines the number of pixels to scroll for each touch of the scroll arrow. For a PICT document, we set this value to 1 for a very fine scroll, but a better value for it — one that balances smooth scrolling with speed — might be 8 or 10.

For a text document, the scroll value is the height of the new line of text that will be brought into view. Text documents don't scroll in the horizontal direction in Generic; the words wrap at the right edge of the frame, so we're concerned only with vertical scrolling.

Generic uses an older-style TextEdit record that has only one text style for all text in the data structure. Therefore, all lines have the same height, which makes it easy to calculate the scroll value. You look up the scroll value in the **TERec** field **lineHeight**, as in

```
scrollVal.v =
  (*docText)->lineHeight
```

Rendering the Scrolled Document

Generic's rendering functions reside in the module Display.c. To render the scrolled document, Generic uses a combination of clipping and offsetting on the document's contents by the **curScroll** value before drawing them. *Clipping* is a computer-graphics term that you might not be familiar with, but if you've ever used masking tape while painting, you should be familiar with the process. Clipping limits drawing to a particular area, in this case, the window's frame. Clipping ensures that the document's contents don't overwrite the scroll bars. Remember, they lie in the content region of the window.

Pictures are rendered with the QuickDraw procedure **DrawPicture**. **drawDocPICT()** offsets the picture frame by the inverse of the document's current scroll for the proper effect, first setting the window's clipping region to the window frame.

TextEdit data is rendered by the TextEdit routine **TEUpdate**. A more thorough discussion of TextEdit is required than we have space for here, but briefly, Generic offsets the destination rectangle of **TERec** by the document's current scroll before its call to **TEUpdate**. In essence, both rendering functions use the same technique — offset and then draw. It's the implementation details that differ with the document contents.

The Control Manager

You need a user interface to initiate the scroll, and here's where the System lends a big hand. Scroll bars are controls, and you manipulate them with Control Manager routines. The scroll bars of last month's Generic were inoperable and rendered inactive; today you'll activate them by changing their *highlight state* with **HiliteControl**.

Activation of the controls occurs during window activation, but Generic has to abide by the mañana principle and draw only during the update event. It therefore invalidates the scroll bars, secure in the knowledge that the subsequent update event will render them.

drawScrollBars(), which is in WindowUtil.c, consolidates all the logic to draw active and inactive scroll bars correctly. Scroll bars have a minimum, maximum, and current value, and this is represented by the position of the elevator box and set with the calls **SetCtlMin**, **SetCtlMax**, and **SetCtlValue**. **drawScrollBars()** is responsible for managing the task of setting the control's correct values, which is based on the document's **curScroll** and **maxScroll**, before drawing them.

Determining the Scroll Parameters

Once the scroll bars have been activated, they can accept mouse-down events. After **doMouseDown()** determines that the mouse click was in the content region of the window (remember the scroll bars are in the content region), **doInContent()** calls the Toolbox Manager routine **FindControl**. If the mouse was clicked in a control, this routine returns true and supplies you with the handle to the control and with the part code of the control where the mouse-down happened.

mouseInScroll() is called with the relevant information (see Example 1) and passes control to **scrollDoc()** in several ways, depending on the part code. Because the mouse can stay down in an arrow part, causing continuous scrolling, **TrackControl** is the calling agent for **scrollDoc()** when the part code is an arrow. (Note that the only purpose of **scrollWinProc()** is to format the call for **scrollDoc()**.) Clicking in the page areas calls **scrollDoc()** directly, and clicking on the thumb also requires **TrackControl**, with a final call to **scrollDoc()**.

Generic's scrolling is encapsulated within **scrollDoc()** (see Example 2). It is passed the control handle, a part code, and a scroll-value multiplier. The first lines of code in **scrollDoc()** find out what scroll bar it is dealing with — horizontal or vertical — and set the local variables **hScroll** and **vScroll**. These values are the pixel value to be scrolled, according to the control; the document's **scrollVal**; and the scroll-value multiplier. After this initialization phase, **scrollDoc()** enters a scrolling loop.

Inside this loop, a few things happen. First, the window's clipping region is set to the window frame, which is the area that will scroll. Because you don't want the scroll bars to scroll up or across the window with the document's contents, you set the window's clipping rectangle to the window frame before the scrolling operation. Inside the **switch** are some tests that handle boundary conditions and determine the need to scroll before calling the Power Programming Toolbox-call-of-the-month-club selection, **ScrollRect**.

Now look at how **hScroll** and **vScroll** are assigned — negative values scroll up, and positive values scroll down. When **ScrollRect** has finished, it returns a handle to the area that needs refreshing. Normally, drawing is done inside **doUpdateEvent()**. But, in complete violation of the mañana principle, a mini update handler is invoked, complete with calls to **BeginUpdate**, **drawDocContents()**, and **EndUpdate**. Generic needs to draw inside **scrollDoc()** because Mac users expect their document to continue scrolling while they hold the mouse button down. The loop completes by assigning the new value to the scroll bar. Note that you need to expand the clipping region to the size of the port rectangle so that the scroll bar's thumb can be redrawn in its new location.

> Your scrolling method may be better than ours; if so, we'd like to hear about it.

That's scrolling. The details are left for you to discern from the source code (see the "Source-Code Sources" sidebar). We suggest you use a debugger to trace through a scroll operation and see the thread of what happens and where it occurs in our solution to the problem of scrolling. There are many ways to approach activities with as many variables as scrolling has, and your method might be better than ours. If so, we'd like to hear about it. Drop us a line, in care of *MacUser*.

For example, we could have saved a

Example 1

```
/* ____________________________
   mouseInScroll - react to mouse-down in a window's
   7.1.90cotw                  scroll bars. Parse by part code.
____________________________ */
void
mouseInScroll  (theDoc, theControl, partCode, where)
   DocPtr            theDoc;
   ControlHandle     theControl;
   short             partCode;
   Point             where;
{
   Rect                 frameRect;
   short             oldThumb, newThumb, scrollValue;

   setPortClip  (theDoc);
   switch  (partCode)
   {
      case  inUpButton:
      case  inDownButton:
         TrackControl  (theControl, where, scrollWinProc);
         break;

      case  inPageUp:
      case  inPageDown:
         makeFrameRect (theDoc, &frameRect);

         /* scale the scroll by the document's scroll value */
         if (GetCRefCon (theControl) == kHScrollTag)
           scrollValue = (frameRect.right - frameRect.left)
              / theDoc->scrollVal.h;
         else
            scrollValue = (frameRect.bottom - frameRect.top)
               / theDoc->scrollVal.v;

         scrollDoc (theDoc, theControl, partCode, scrollValue);
         break;

      case  inThumb:
         oldThumb = GetCtlValue (theControl); /* current thumb */
         TrackControl (theControl, where, NULL); /* user feedback */
         newThumb = GetCtlValue (theControl);  /* new value */

         scrollByThumb (theDoc, theControl, oldThumb - newThumb);
         break;
   }

}  /* mouseInScroll */
```

Example 1: `mouseInScroll()` is called when `FindControl` returns true, signifying that the mouse-down was in a control.



few lines of code in **scrollDoc()** by moving **ScrollRect** and the new **curScroll** calculations outside the **switch**, arithmetically negating the values of **hScroll** and **vScroll** in one case. This kind of optimization sacrifices clarity for the sake of economy of space. Although the practice of squeezing bytes out of the object code is the modus operandi in commercial sweatshops, traditionally it is the final step in program refinement. (Some software houses actually recode key passages of

> We want Generic to serve as both generic shell and teaching tool, and no teaching tool is effective without experimentation.

the program in assembly language at this stage.)

Generic is your program ("the only program you'll ever need"), and you're encouraged to make refinements. In fact, our intent is always that it serve as both generic shell and teaching tool, and no teaching is effective without exploration and experimentation. Never forget that the development process is cyclical, and you should thoroughly test any changes to working code. Design, implement, and test — please don't forget to test. Testing reveals bugs and therefore takes you back to where you started — to the design phase.

But, while you're burning the midnight oil, pushing the envelope of new technology, we recommend that you temper your efforts with the wisdom of the old adage "If it ain't broke, don't fix it."

Source-Code Sources

You can get a copy of the C code for this month's column by logging on to CompuServe and typing GO MACUSER at any ! prompt. If you are not a CompuServe user, you can call (800) 848-8199 or (614) 457-8600 for more information on subscribing. Alternatively, you can order the disk directly from us for $10 by calling (800) 952-6300 and asking for Department 28.

Example 2

```
/* ____________________________
   scrollDoc -   the quintessential scrolling routine,
   7.1.90cotw    scrollDoc is called for all document scrolling
                    from scrollProc or directly for the thumb
                    and page scrolls
   ____________________________ */
static void
scrollDoc (theDoc, theControl, partCode, value)
   DocPtr            theDoc;
   ControlHandle     theControl;
   short             partCode, value;
{
   register short    hScroll, vScroll;
   Rect                 frameRect;
   long                 ref;
   RgnHandle         updRgn;

   /* what scroll bar, horiz or vert, did we get? */
   ref = GetCRefCon (theControl);

   /* assign scroll pixel value to appropriate scroll variable */
   hScroll = (ref==kHScrollTag) ? (value*theDoc->scrollVal.h) : 0;
   vScroll = (ref==kVScrollTag) ? (value*theDoc->scrollVal.v) : 0;

   /* need this region in ScrollRect */
   if (!(updRgn = NewRgn()))
      return;

   /* loop here while the mouse stays down */
   do
   {
      setFrameClip  (theDoc, &frameRect);      /* clip to content */

      switch (partCode)
      {
          case inPageUp:
          case inUpButton:
             /* adjust scroll value at the top (or left) boundary */
             if (vScroll && theDoc->curScroll.v - vScroll < 0)
                vScroll = theDoc->curScroll.v;
             else if (hScroll && theDoc->curScroll.h - hScroll < 0)
                hScroll = theDoc->curScroll.h;

             /* if we have a scroll value */
             if (vScroll || hScroll)
             {
                /* scroll the document */
                ScrollRect (&frameRect, hScroll, vScroll, updRgn);

                /* adjust document's current scroll */
                if (hScroll)
                   theDoc->curScroll.h -= hScroll;
                else if (vScroll)
                   theDoc->curScroll.v -= vScroll;
             }
             break;

          case inPageDown:
          case inDownButton:
             /* adjust value at the bottom (or right) boundary */
             if (vScroll &&
                 (vScroll + theDoc->curScroll.v) > theDoc->maxScroll.v)

                vScroll = theDoc->maxScroll.v - theDoc->curScroll.v;

             else if (hScroll &&
                 (hScroll + theDoc->curScroll.h) > theDoc->maxScroll.h)

                hScroll = theDoc->maxScroll.h - theDoc->curScroll.h;

             if (vScroll || hScroll)
             {
                ScrollRect (&frameRect, -hScroll, -vScroll, updRgn);
                if (hScroll)
                   theDoc->curScroll.h += hScroll;
                else if (vScroll)
                   theDoc->curScroll.v += vScroll;
             }
             break;
      }

      if (!EmptyRgn (updRgn))  /* scrolled it */
      {
         InvalRgn (updRgn);

         BeginUpdate (theDoc);
         drawDocContents (theDoc); /* note: mini update process */
         EndUpdate (theDoc);

         SetRectRgn (updRgn, 0, 0, 0, 0); /* clear out region */
      }

      setPortClip (theDoc); /* expand clip to include scroll bars */

      /* adjust scroll bar appearance */
      SetCtlValue (theControl,
         hScroll ? theDoc->curScroll.h : theDoc->curScroll.v);
      SetCtlMax (theControl,
         hScroll ? theDoc->maxScroll.h : theDoc->maxScroll.v);

   } while (StillDown()); /* end of loop */

   if (updRgn)
      DisposeRgn (updRgn);

} /* scrollDoc */
```

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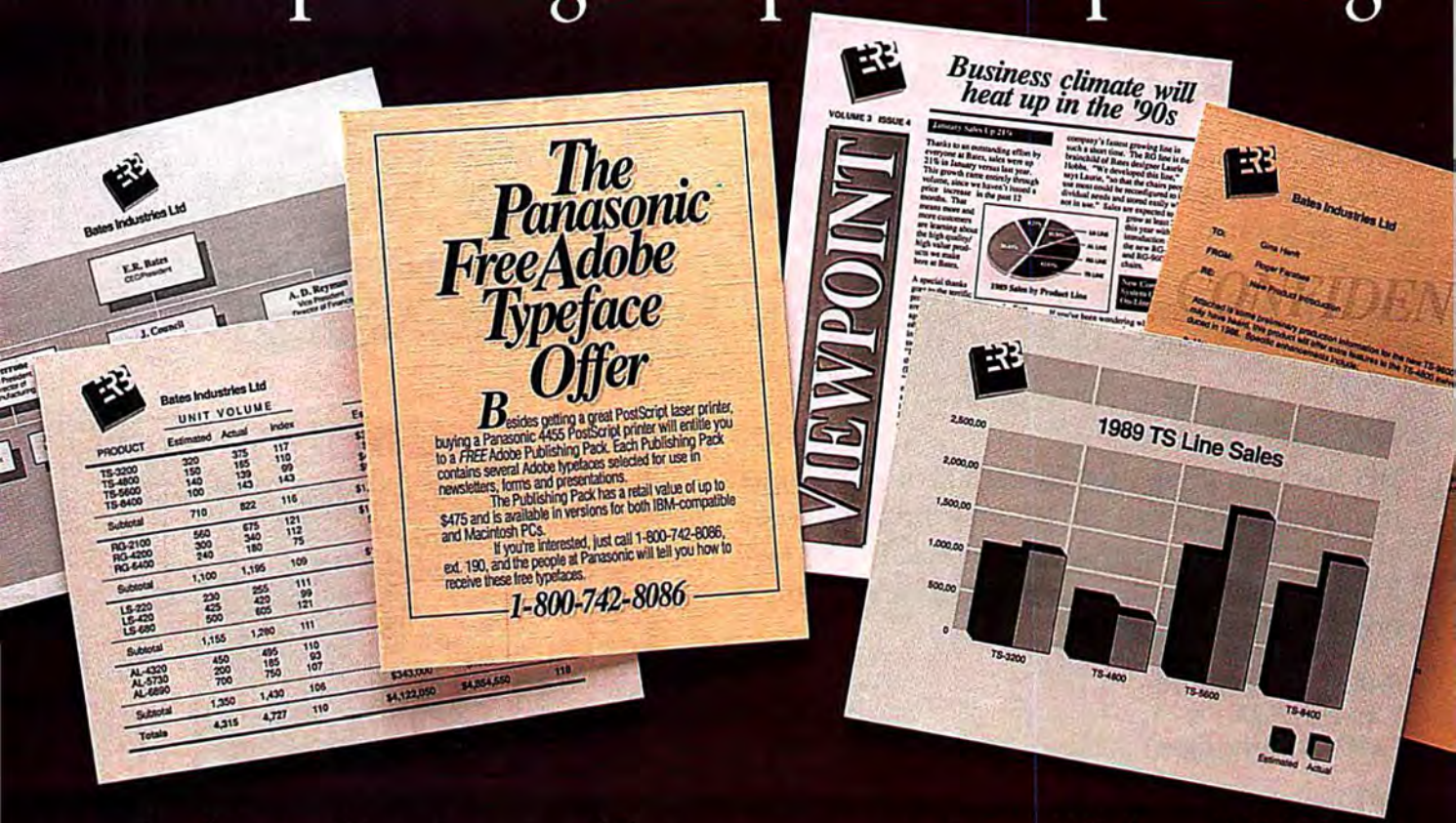
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TIP SHEET

Tip Sheet

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MacWrite II

MacWrite II handles graphics well, but because it treats a pasted graphic as if it were a single typed character, it doesn't support text on the same line as the graphic.

One way around this problem involves Canvas 2.0 or 2.1. Canvas allows the creation of three kinds of objects: draw objects (MacDraw-like), bit-mapped painting objects, and text objects.

You can easily create a graphic in Canvas with several lines of text and then import it into MacWrite II, using either the Clipboard or the Scrapbook. The text in the Canvas graphic retains its text-styling attributes and, for printing purposes, is processed as text by MacWrite II (and Adobe Type Manager), including fractional character widths (see Figure 1).

This recognition by both MacWrite II and ATM of the text attributes of text in a Canvas document even extends to popping up an alert box if the appropriate font is unavailable (text will print as a bit map if the required font isn't present).

The catch is that you can edit the text object only in Canvas (as part of an inserted graphic — the text isn't accessible from MacWrite II). Thanks to the spelling checker built into the latest version of Canvas, it's possible for you to check the spelling before the object is pasted into your MacWrite document.

This same technique may also work with other combinations of word-processing and graphics applications.

Donald L. Archibald, Jr.
Kerrville, TX

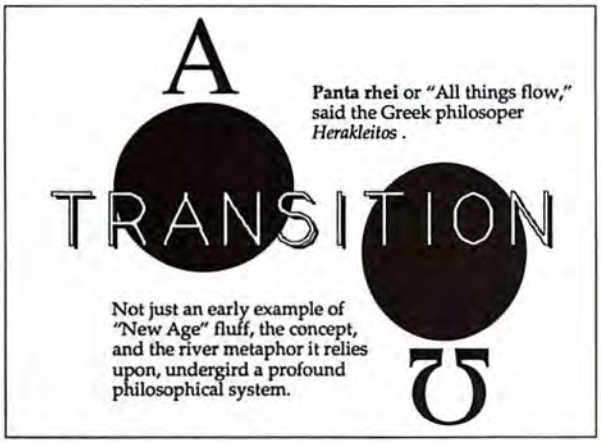


Figure 1: MacWrite II doesn't support side-by-side graphics and text, but with the help of Canvas or a similar draw program, you can mimic the effect.

Zapf Dingbats

You can get a plain empty box — to indicate the Macintosh's no-character symbol or for such uses as a check box — with a word processor or desktop-publishing program such as Word, QuarkXPress, or PageMaker. The Zapf Dingbat font has shadowed and filled boxes, but not empty ones.

To create an empty box, type a lowercase *n*. Select the character and then choose Zapf Dingbats from the Font

Tip of the Month

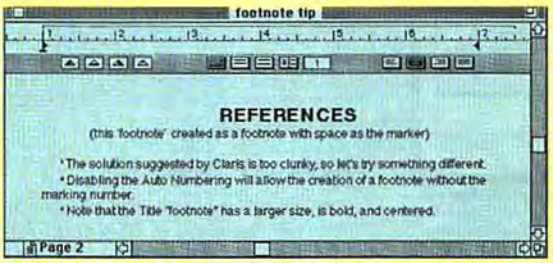


Figure 2: Adding a title to the first footnote page at the end of a document involves a little trick with the Auto Numbering function of the Preferences command.

MacWrite II

If you place footnotes at the end of a MacWrite II document, you'll discover that the footnote page cannot be fully edited. That means that you can't easily add a title, such as "REFERENCES," to the top of a page. Claris' technical support says that the official solution is to save the document as a text file, reopen it, and edit the final footnote page as needed.

A better solution is to create footnotes in the usual way — in this case, auto-numbered and placed on the last page. Before you print, change your footnote preferences to disable the Auto Numbering option. Now place the insertion bar somewhere before the first footnote marker and insert a dummy footnote.

When you're prompted for the footnote marker, use a space, which will be invisible in the body of the text. For the actual footnote, type the desired title ("REFERENCES," for example). It will be unnumbered on the footnote page and will appear before footnote 1. You can edit this title/footnote to change its size, style, and ruler configuration so it matches other titles in the document (see Figure 2).

If you want to add other footnotes to the paper after you've created the title/footnote, don't enable auto-numbering. Instead, when the prompt for the footnote marker appears, press Return, and the appropriately numbered footnote marker will appear — without disturbing the title/footnote.

Craig Harris
Seattle, WA

Compiled by Gregory Wasson

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TIP SHEET

menu and Outline from the Format menu. Voilà! An empty box (□). If you want a box with a heavier border, make the character bold as well as outlined.

You can make the box any point size, but if you want it to appear the same size as the text you're working with, make the box a point size or two smaller. For example, if your text is 11 points, the box should be 9 points; if you have 9-point text, you should make the box 8 points. Otherwise, the box appears to be slightly larger than the surrounding text.

Shari L. Allison
San Mateo, CA

General

When transferring text from one document to another — for example, from a word processor to a page-layout program — be aware that spacebar spaces are related to the size and style of each individual font. If you line things up beautifully and then change the font or export your text to another program, the spaces can change unexpectedly. To ensure exportability of text, use tabs rather than multiple spaces.

This tip is obvious but frequently overlooked by both advanced and novice computer users.

Robert R. Wresch, M.D.
Loma Linda, CA

If you've upgraded to PageMaker 3.0 or later and have tried to open one of your old PageMaker 2.0 documents by double-clicking on its icon on the desktop, you've probably discovered that the double-clicking shortcut no longer works. But you don't always need to use a file editor such as MacTools to perform minor surgery on the type and creator of old documents (that is, substituting the type and creator names of the upgraded application).

Simply open the application first, and then try to open your old document with the Open command (usually Command-O), selecting the document in the standard-file dialog box. More often than not, the application can convert the old format and open an untitled copy of the older file. Then save it with a new name. When you return to the Finder, you'll find a double-clickable copy of the renamed file in the new format. If you want to avoid duplicate files, save the copy under the old name so that it overwrites the original file.

Brian A. Lareau
Ferndale, MI

FreeHand

When you select New from the File menu in Aldus' FreeHand, your new page appears with a sometimes-annoying set of its own defaults. They include Snap to Grid, many different shades of gray, line weights, and other items that most people usually end up changing.

If you want to avoid this problem, start by creating a template that has whatever line weights, fills, and colors you use regularly. Turn on features you consistently use, and turn off those you don't (I lock my guides, turn on Snap to Guides, and turn off Snap to Grid).

Once you've set everything to your liking, save the document as a template, name it Aldus FreeHand Defaults, and replace the old Aldus FreeHand Defaults in your FreeHand folder. (You might want to rename the old defaults first, in case you want to use them again.)

You can't change some things, such as the default font and font size, but you *can* add guides, select your printer type, and set the measuring system to the standard you prefer, just as with a regular template.

Jim Cutler
Seattle, WA

Canvas 2.1

Anyone who uses Canvas to produce schematics knows that creating labels can be time-consuming. Although the following technique doesn't eliminate all the drudgery, it can speed the process considerably.

When you're working on a drawing such as a schematic that requires many labels, zoom into the area where you need labels and, using the text tool, type a list containing the labels for the desired on-screen objects with a Return after each label. Then, still using the text tool, select the last item, cut it, position the cursor where you want the label, and paste it in. Repeat this process until all the labels are placed. Select the pointer tool if you need to adjust the position of any labels.

This method is much faster than selecting the text tool, typing the text, selecting the pointer tool, selecting the label, positioning the label, and repeating the process for each label. With a little practice, you should be able to position the cursor and paste the label without needing to adjust the locations.

Howard Adkins
Tucson, AZ

FullWrite Professional

Here's how you can access a hidden screen in FullWrite 1.0 and 1.1. Move the cursor to the upper right corner of the screen. Hold down both the mouse button and the Command key, and drag across to the Apple menu. When you've pulled down the Apple menu, release the Command key and press the Option key. The

FullWrite Professional

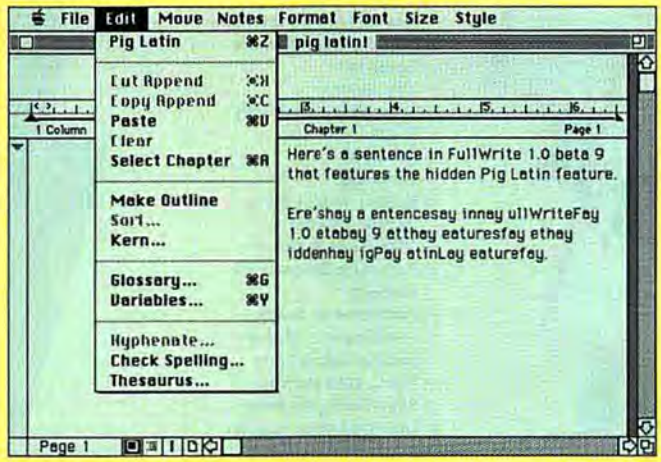


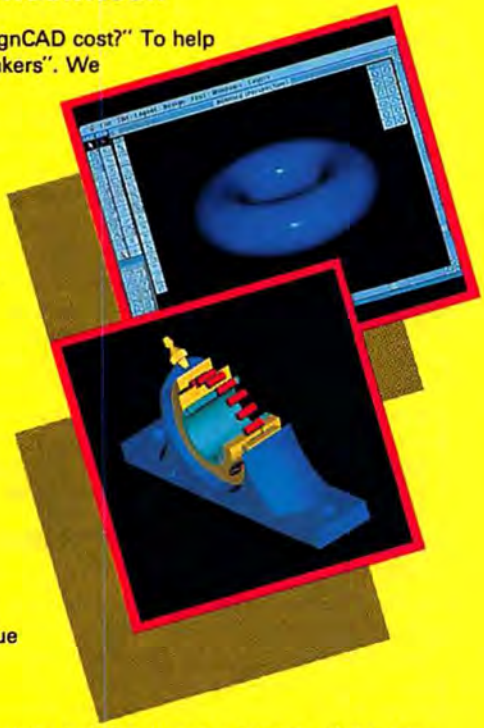
Figure 3: It may look like reekGay to you, but it's actually a pig-Latin translator found in a widely distributed beta version of FullWrite Professional.

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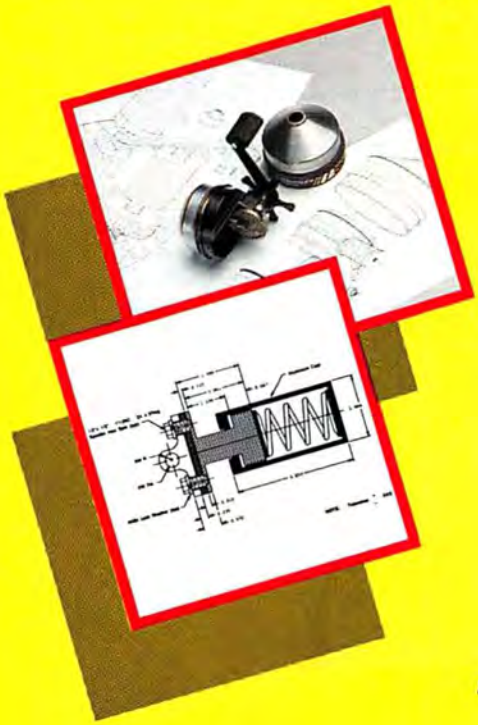
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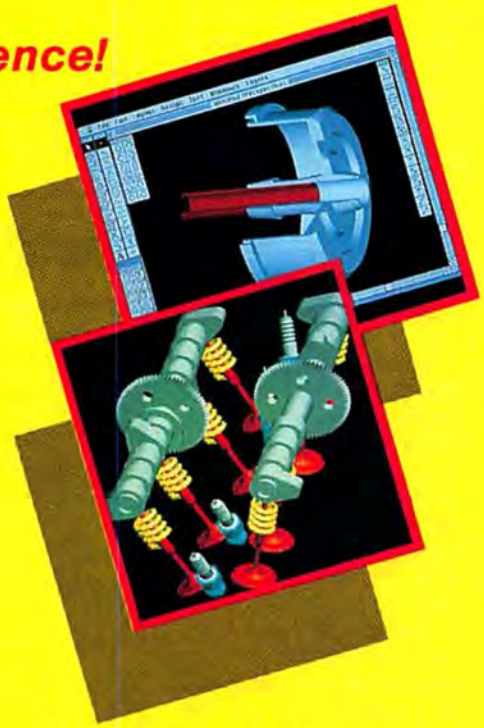


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PageMaker

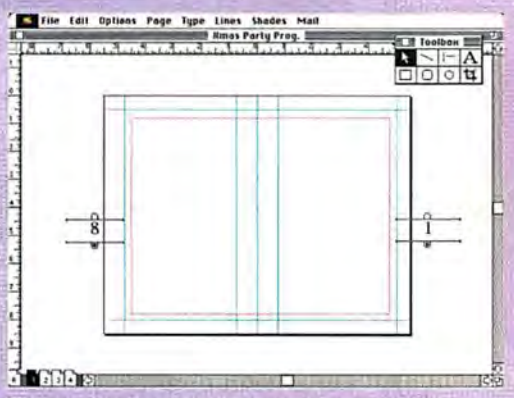


Figure 4: Keeping the sequence of pages straight for a PageMaker brochure or flier is easy if you add nonprinting page numbers to the pasteboard.

About FullWrite command changes to read About Dancing Bear. Selecting this command brings up a special screen (provided that the program can find the FullWrite Help file; if not, it asks for your assistance).

Many people received beta copies of FullWrite during the long wait for the official release, so here's a special tip for anyone who still has a copy of the FullWrite 0.9 beta.

In any document, type the word *pig*, press the Backspace or Delete key three times, and pull down the Edit menu. The name of the Undo command changes to Pig Latin. If you choose this command and start typing, the words will be displayed in pig-Latin format, with the first letter of each word moved to the last position, with *ay* appended (see Figure 3).

Bob Morrish
Los Gatos, CA

PageMaker

Placing text in brochures and programs is easier if the pages are visibly numbered. When the pages are folded, however, the page icons at the bottom of the PageMaker window have little or no relation to the finished brochure's page numbers.

Text blocks that extend off a page are tied to the page, even when the text appears exclusively on the pasteboard. The text that appears on the pasteboard does not appear there when another page is displayed.

Using the text tool, click on the right-page margin and drag diagonally an inch or so onto the pasteboard. Select a large font (48-point Times, for example) from the Type menu, choose center alignment, and type the page number. Select it with the pointer tool, resize the text block so the number falls just outside the page, and copy it to the Clipboard. Paste a copy to the left margin, and change the number to the last page number (see Figure 4). Click on the next page icon, and paste two more numbers.

For a single sheet, four-page brochure or flier, the numbers should be 4-1 on side 1, and then 2-3 on side 2. For a two-sheet, 8-page brochure, the numbers should be 8-1 on side 1, 2-7 on 2, 6-3 on 3, and 4-5 on 4.

When placing text, particularly from a single word-processing document, start on page 1, go to page 2, then 3, and so on — and then go back to the last page on the first side. Changes should be made in the same order. Changes in positioning of text on later pages may be distorted by changes in preceding pages.

This also works for fanfold brochures, but not as logically. You don't need to number the centerfold, because its number is always one higher than the left fold and is easily remembered. Generally side 1 is numbered 5-(6)-1, and side 2 is numbered 2-(3)-4.

Douglas Wells
Vienna, IL

HyperCard

Let's say you've been using a stack that requires switching from card to card and entering text — but always at the end of a scrolling field. The speed of text entry is hampered because when you open a card, you have to scroll to the end of the field and click after the last word before you can type the text.

Here's a short background script that causes the cursor to appear automatically at the end of the scrolling field whenever you switch to another card (see Figure 5).

If you want to make sure that the cursor always appears below the last line, even if the last line doesn't end in a carriage return, make the script read as it appears in Figure 6.

Frederick Moyer
Pepperell, MA

Excel

Editing the Excel Formula Bar with the mouse can be a test of dexterity. It might actually be impossible for a physically impaired user.

The Microsoft manual doesn't mention that the insertion bar can be manipulated with arrow keys. The trick is to activate the Formula Bar first with Command-U instead of with the mouse. Once activated from the keyboard, the left and right arrows will then move the insertion point one character. With the Command prefix, the left/right arrows move one field per stroke. This field can be a word, a space, a symbol, or a cell reference, for example. With the Shift prefix, the region through which the bar moves is extended and highlighted in the usual way.

Jeffrey A. Glassman
El Toro, CA

HyperCard

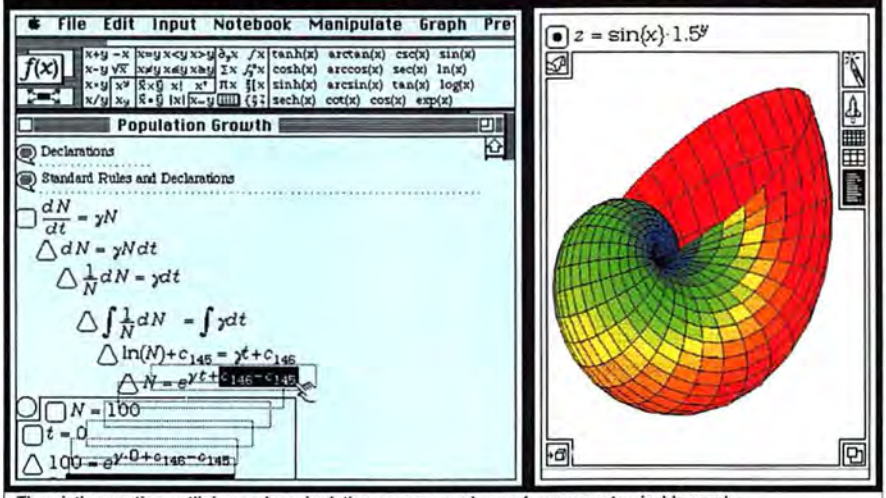
Fig. 5

```
on opencard
  select char (the number of chars ¬
  in bg fld x) + 1 of bg fld x
  type selection
end opencard
```

Fig. 6

```
on opencard
  if last char of bg fld x <> ¬
  return then
    put return after bg fld x
  end if
  select char (the number of chars ¬
  in bg fld x) + 1 of bg fld x
  type selection
end opencard
```

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Help Folder

Answers to Readers' Questions

Is your Mac sick? Need a diagnosis? Leave it up to the doctor — Bob LeVitus. He's the author of Dr. Macintosh: Tips, Techniques and Advice on Mastering the Macintosh *and the former editor-in-chief of* MACazine. *Now he's also the guy who answers your questions in this space every month.*

✉ Write to
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Foster City, CA 94404

Hurricane Update

In our March issue, we published a letter requesting information about hurricane-tracking programs (Help Folder, page 227). I recommended the commercial product MapMaker. Several readers wrote to suggest other, less expensive solutions. Now that hurricane season is just around the corner, you might want to check them out.

Reader Dwight Stewart says: "MacHurricane ($20; William I. Chenault; 3149 Country Club Road, Shalimar, FL 32579; demo version available on GEnie) plots storm location and compiles statistics such as wind strength. It doesn't project where the storm might be heading. Hurricane Tracker ($29.95 plus $2.50 shipping and handling; Prof. John E. Brockhoeft; P.O. Box 241, Loyola University, New Orleans, LA 70118) is an excellent HyperCard application that plots storm location and projects where a storm will hit land. I used both to track Hurricane Hugo in 1989. Since I live by the ocean in South Carolina, it's a good thing I did. Both worked very well, but Hurricane Tracker is more polished; it accurately projected where Hugo would land. Whereas the meteorologists were projecting landfall south of Charleston, Hurricane Tracker projected landfall slightly north of Charleston — where the storm actually hit! Not bad for a $30 program."

Readers Ted Kirchharr and Liz Natale recommend Force 12 (shareware — available in the usual places or from the author for $17, or $12 if you send a formatted disk; Jon Barry, 215 Reidland Road, Crosby, TX 77532). Ted says "it includes all storms listed in NOAA records from 1886 to 1986. The location, wind speed, and central pressure are available for the 831 storms in the database. You can also display storms by category and time of year, as well as storms that cross a user-defined box drawn on the map." Liz adds, "The program also lets users search for hurricanes by intensity, year, or month, or a combination of the three. New storms can be plotted by the user."

Other Goofs Dept.

In March I said no word processor allows you to view and edit successive pages side by side, and that you'd have to invest in a page-layout program if you desired that feature. I goofed. MacWrite II (Claris Corp., 5201 Patrick Henry Drive, Santa Clara, CA 95052-8168; [408] 987-7000) can not only edit pages side by side but also supports side-by-side editing in a reduced view. Always could. Sorry 'bout that!

Alternative to Apple FDHD?

Q. I have a Mac Plus and would like to add SuperDrive capability to it. Other than PLI's TurboFloppy 1.44, which doesn't read Mac 400K or 800K disks, is there a third-party product in existence (or on the horizon) that could act as an alternative to Apple's exorbitantly priced external FDHD?

Timothy J. Crnkovic
Joliet, IL

A. To begin with, the "exorbitantly priced" Apple external FDHD won't work with your Plus. What you need are

Change Fonts in the Finder?



Figure 1: Layout lets you change the Finder's display font and size, icon spacing, default colors, and more.

Q. Is there some way to make the Finder display text in a prettier font than the one it comes with?

Audrey Mitchell
Chicago, IL

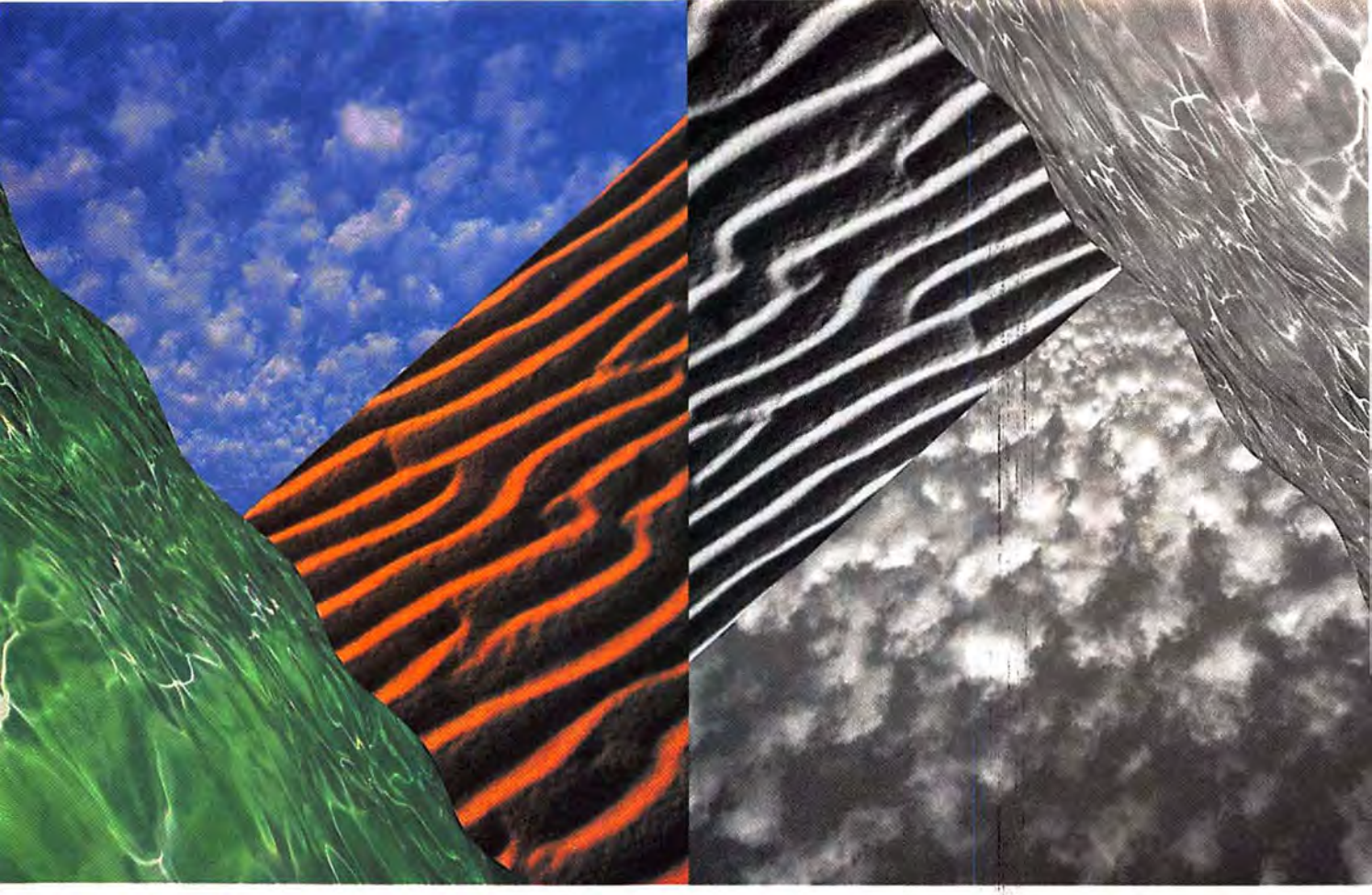
A. Layout 1.9, a public-domain application written by Mike O'Connor (author of CompuServe Navigator), does what you want and more. It lets you customize your Finder to your heart's desire. You can change the font and size of text and adjust the column width in all text views.

If you have a color-equipped Mac, you'll love Layout's ability to pick new colors for the Color menu. Layout also allows you to modify almost a dozen other Finder attributes (see Figure 1).

Layout provides control over many behind-the-scenes Finder functions as well. For example, you can enable an invisible grid so that dragged icons always line up perfectly without use of the Clean Up command. If you like to live on the wild side, you can turn off the warning you ordinarily get when you throw an application or System file into the Trash.

Layout is one of my favorite Mac hacks. It's the first program I run after I install new system software on any of my hard disks.

By Bob LeVitus



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a pair of peripherals, Rapport and Drive 2.4 (Kennect Technology, 120-A Albright Way, Los Gatos, CA 95030; [800] 552-1232 or [408] 370-2866). Rapport is a plug-in microprocessor and drive controller that lets your Mac read 3.5-inch, 720K MS-DOS, OS/2, and ProDOS disks (low density), using the existing 800K internal drive. Drive 2.4 is an external drive that, in addition to supporting all existing Apple and IBM 3.5-inch disk formats, supports two very-high-density formats that provide 1.2 megabytes of storage on 800K disks and 2.4 megabytes on high-density disks. Rapport supports the Mac 512KE, Plus, and SE; Drive 2.4 supports the 512KE, Plus, SE/30, II, IIx, IIcx, and IIci (and *probably* the new IIfx, although it hadn't been tested at press time).

Such wizardry is possible because the products are the brainchild of Wendel Sanders, a major contributor to the Apple III team and codesigner of the SWIM disk-controller chip that controls the floppy drive in Macs that have FDHDs. (Interesting Macintosh trivia: SWIM stands for Sanders/Wozniak Integrated Machine, not Super Wozniak Integrated Machine or Steve Wozniak Integrated Machine, as many mistakenly believe.)

Developing Software Ideas

Q. I've just purchased a new SE with a 40-megabyte internal hard disk. I've used Macs for the past three years. I have some ideas for new software, and even though I'm not a programmer, I would like to develop them.

Can I do all of this from my SE? Are there books that can help me? What software should I use?

Kurt Schemers
Peoria, AZ

A. You don't say how complicated your project is, but since learning to program in a high-level language such as Pascal or C can take months (or years), the first thing you should do is learn HyperCard.

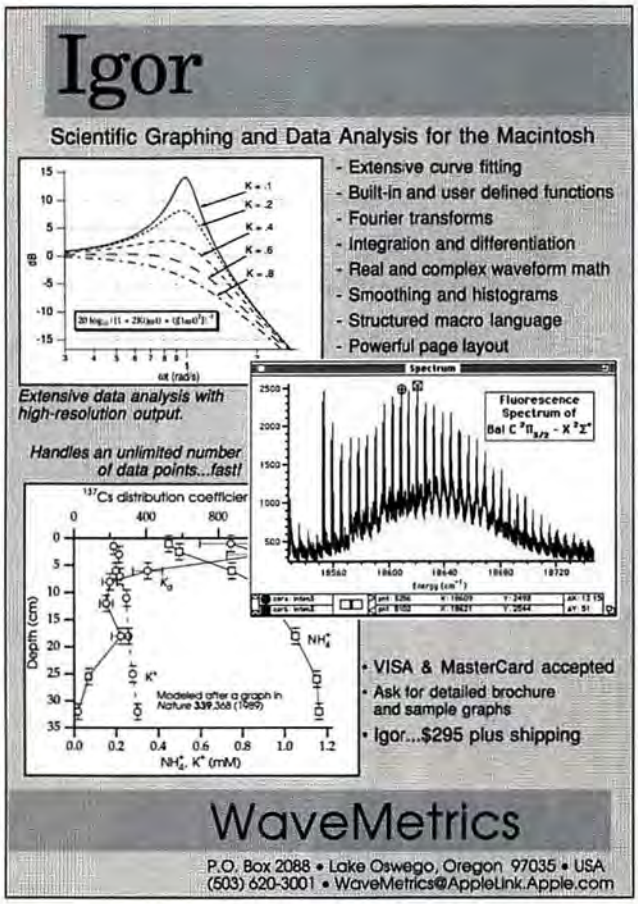
HyperCard has been called an authoring tool, a software engine, a hypermedia toolkit, and an information organizer. It's all of that, but it's also an object-oriented programming environment that uses one of the easiest-to-learn programming languages, HyperTalk.

> If HyperCard isn't powerful enough to build your program, try SuperCard — it's like HyperCard on steroids.

Danny Goodman's *The Complete HyperCard Handbook* (Bantam Computer Books) is the definitive book on the subject.

Once you get the hang of HyperCard, you may find it's not powerful enough to build your program. Try SuperCard (Silicon Beach Software, 9770 Carroll Center Road #J, San Diego, CA 92126; [619] 695-6956). It's like HyperCard on steroids — it can do everything HyperCard can and a lot more. It uses a language called SuperTalk, which is a superset of HyperTalk, so once you've learned HyperCard, mastering the additional power of SuperCard will be relatively painless. SuperCard provides many functions not available from HyperCard, including hierarchical and pop-up menus, multiple windows, full color support, and support for animation.

If you find that you're still



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unable to create the program of your dreams with SuperCard, you'll have to invest the time to learn a real programming language. If you do, check out the Power Programming column that Kurt Matthies and Thom Hogan write for this magazine. It won't teach you the basics of programming, but it does cover the special problems that programmers face on the Mac.

Printing PostScript Files

Q. In *MacUser*'s February '90 Tip Sheet, the Tip of the Month (page 267) made me realize that I might be able to save time by generating a PostScript file on my Mac and taking it to a Mac connected to a LaserWriter. That way I wouldn't have to worry about the parent application's not being there. Is there a way to generate output on a LaserWriter with just the PostScript file?

Carl Finocchiaro
Denver, CO

A. You can't do it with *just* the PostScript file. You'll also need an application or DA capable of sending the file to the printer. Adobe's Font Downloader can, in addition to manually downloading fonts, download PostScript files one at a time. CE Software's Widgets application or LaserStatus DA can download files one at a time or in batches.

Font Downloader is included with Adobe fonts, and you can download it from the Adobe Forum on CompuServe. Widgets and LaserStatus DA are bonus programs included with CE Software's excellent Finder-replacement DA, DiskTop.

Telexing with a Mac

Q. Many of my overseas customers still insist on using telex. How can I get my Mac II to send telex messages? Do any telecommunications-software packages send telexes?

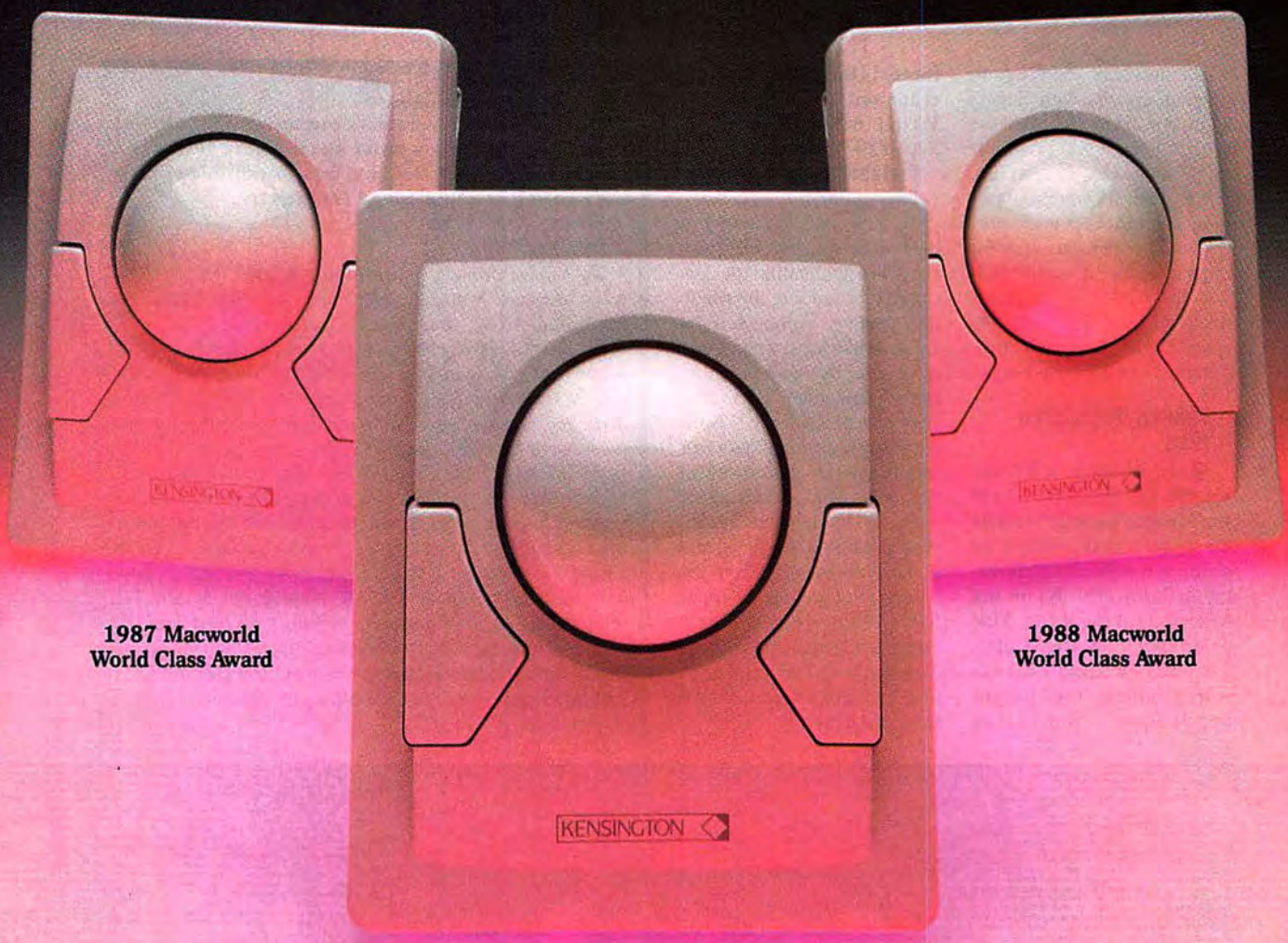
Douglas M. Grossman
Cleveland, OH

A. You're in luck. At least three services let you send telex messages from any Mac equipped with a modem: MCI Mail, AT&T Mail, and CompuServe.

Using the Desktop Express software package from Dow Jones Software, which simplifies using MCI Mail, is the easiest way to send telex messages. Save frequently used telex addresses in your Address Book, and you can send messages with a few double clicks.

AT&T Mail and CompuServe are a little less user-friendly. Sending a telex with either of these systems involves addressing your communications with special codes. On CompuServe, for example, you enter the EasyPlex mail subsystem (type **`Go Easy`** at any prompt) and address your correspondence: **`>TLX 12345 howdy`**, where *12345* is the telex-machine number of the party you're sending to and *howdy* is the answer-back message. You can obtain complete on-line instructions on using CompuServe's telex feature by typing **`Find Telex`** at any prompt.

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ADB Mouse with a Plus

Q. I own a Mac Plus, which uses a non-ADB mouse. Can I attach an ADB mouse (either one for a Mac or for an Apple IIGS) to my Mac Plus?

Avram Waits
Beverly Hills, CA

A. Unfortunately, no. A product that would allow owners of classic (non-ADB) Macs to use ADB devices was announced a couple of years ago, but it never shipped, and I haven't heard of anyone else working on one. My guess is that it either can't be done economically or can't be done at all.

Crossword Quandary

Q. I need a Mac program for making crossword puzzles. Do you know where I might get one?

Richard Woudenberg
Ridgewood, NJ

A. Publishing Technologies Nederland (17407D E. Rice Circle, Aurora, CO 80015) is putting the finishing touches on a QuarkXPress XTension (add-ons to XPress are called XTensions) named The Puzzler that lets you design crossword puzzles by defining them in a series of windows. It features automatic numbering and full access to QuarkXPress' powerful tools and sounds like just what you need.

The Puzzler's price was not available at press time, but you can bet it won't be cheap — it requires a copy of QuarkXPress ($795). If you're still set on becoming the next Eugene Maleska, The Puzzler should be available by the time you read this.

Excel Won't Load

Q. When the Mac 512KE came out, it was the right price and I snatched it up. It had everything the Mac Plus did except memory and a SCSI port, which I added later with an upgrade to 2.5 megabytes. Everything worked and worked well — until I tried loading Excel 2.2. It told me that I need a Mac Plus or later. With as much memory as I have and the 128K ROMs, why can't I run Excel 2.2?

Barton L. Abbott
Annandale, VA

A. Fortunately, your problem isn't hardware; the answer is a simple (and free) system-software upgrade. You didn't specify which version of system software you're using, but considering the symptoms you're experiencing, it's probably not the latest one. According to Microsoft, Excel 2.2 checks your System file for a "system environment flag." Systems prior to 6.0 do not have this feature, so if you're running a version of System software earlier than 6.0, Excel will think you've got a plain old 512K, no matter how much RAM you've installed. If you're not sure which version you're running, select About the Finder from the Apple menu.

The solution is to upgrade to System 6.0 or later, available free from authorized Apple dealers, user groups, and on-line services. Dealers will charge you $120 for the deluxe upgrade — which includes manuals — but will usually provide the files at no charge if you provide your own floppy disks.

Incidentally, you should avoid System versions 6.0 and 6.0.1 — they have some nasty bugs. The first version generally considered to be stable was 6.0.2. The latest version as of this writing is 6.0.5.



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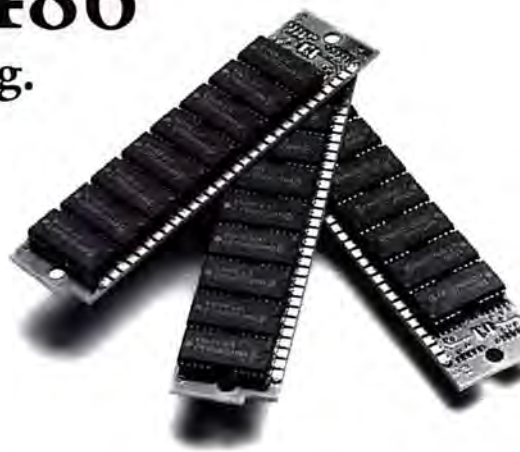
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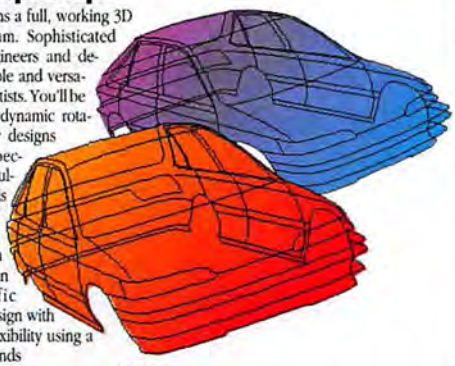
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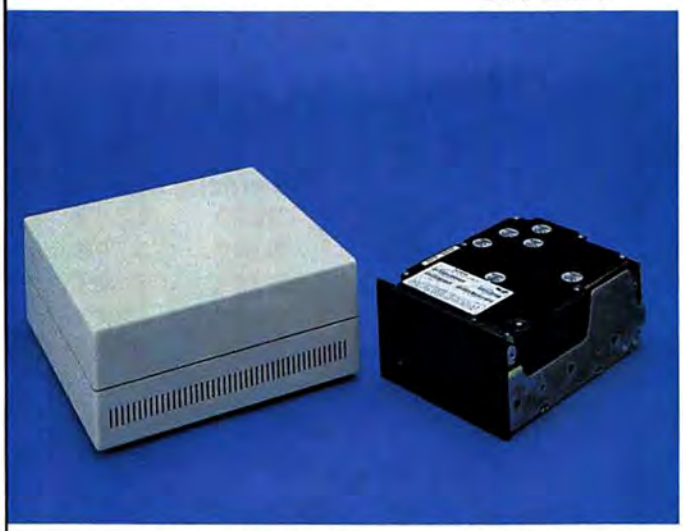
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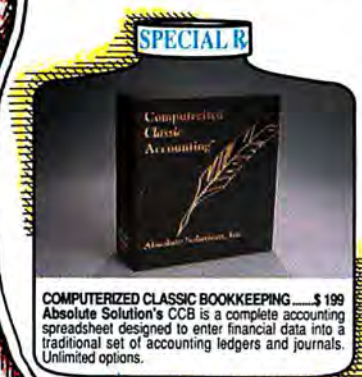
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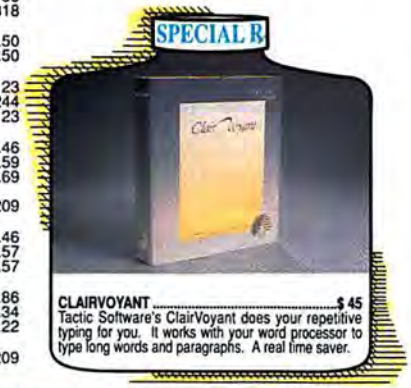


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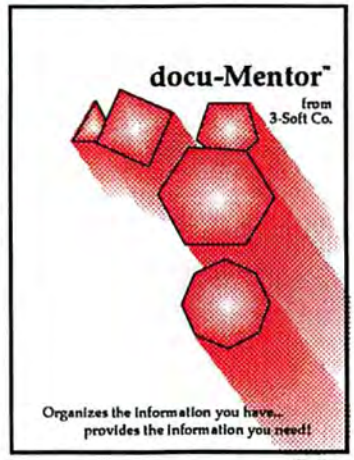
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- ☐ a) Mac Plus
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- ☐ e) Other

2. For how many micro computers do you buy products?

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- ☐ i) Administrative/General Management
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- ☐ r) Word Processors
- ☐ s) Database Managers
- ☐ t) Graphics
- ☐ u) CAD/CAM
- ☐ v) Communications

HARDWARE
- ☐ w) Mainframe
- ☐ x) Mini
- ☐ y) PC
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- ☐ 2) Disk/Tape Back-up
- ☐ 3) Add-in Boards
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5. Are you involved in the purchasing of microcomputer equipment at your company?

- ☐ 5) Yes
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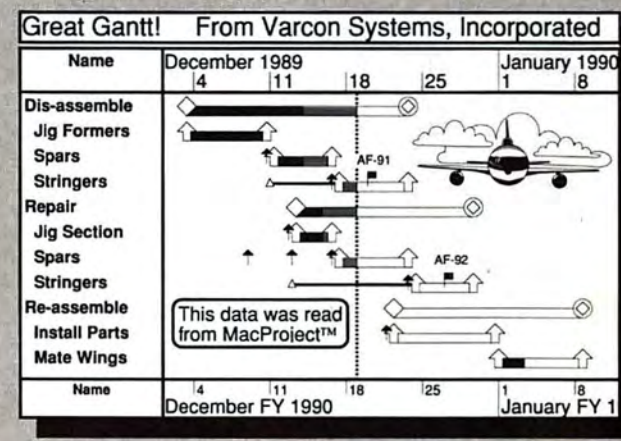
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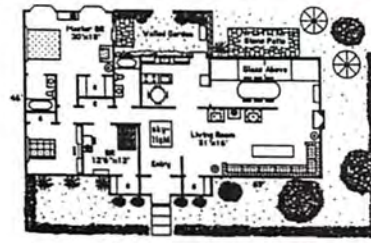
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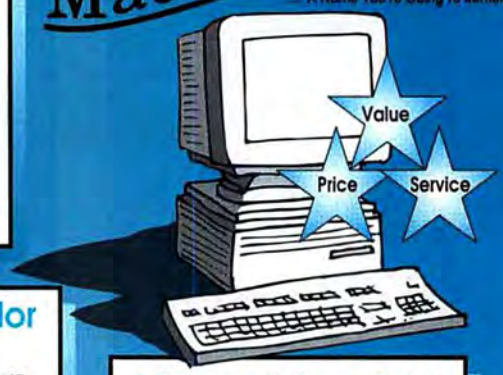
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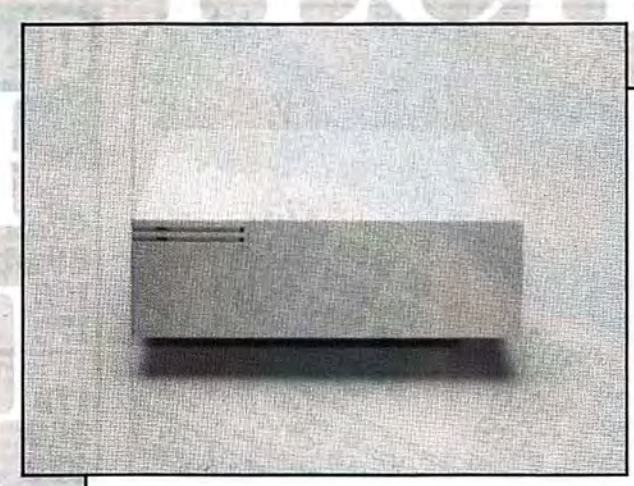
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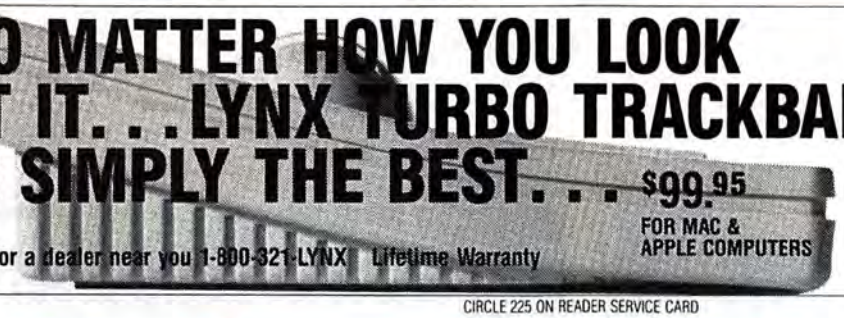
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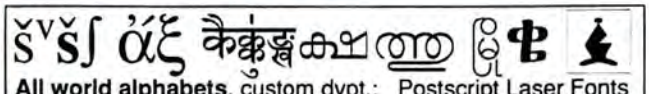


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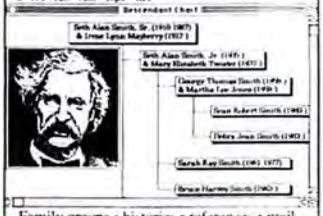


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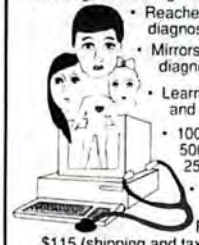
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JOHN C.
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Joke, Reminiscence, Fact, History

Joke: Mike Spindler comes up to John Sculley and says, "John, I have some good news and some bad news. Which do you want to hear first?" Sculley, sitting at his desk wringing his hands, says, "Gosh, the bad news." Spindler says, "The bad news is that this week there is no good news!" Sculley's eyebrows rise. "Then what's the good news?" Spindler smiles and says, "The good news is: *That's* all the bad news."

Reminiscence: The rewrite of that old joke reminds me of the marketing department at Apple. They seem to be stuck in some tautological mire. Going nowhere fast. In circles.

Fact: Apple is not selling the true benefits of Macintosh computing. It now seems obvious that they don't know what the benefits are and that they don't understand what personal computing is all about. This is ironic, as Apple is largely responsible for popularizing the personal computer and then taking the experiences of their own users to invent a new machine that eliminates nearly all the aggravations of setting up and using a computer. You have to wonder if anyone in the Apple Marketing Department has a clue about this.

History: Let's lay it out for them. The Mac was designed during a time when users were stuck with horrid Apple II machines that required a Print command to get the floppy-disk drive to output a simple directory. Idiocy at its peak. The business world was dominated by CP/M computers, which couldn't even talk to a printer without making their users install patch after patch after patch to get anything to work. Once a system was up and running, nobody dared touch it or change anything, lest never-ending man-years of trial-and-error coding and fooling around be required to get the system to work again.

The Mac designers must have been sick of this crapola. The basic premise of the Mac's creation was that it would perform like an appliance. You simply plugged it in and used it. Unfortunately, the appliance metaphor was ridiculed and misunderstood — at that time, the company's marketing prowess was at an all-time low, as an ineffective sort of cult marketing took over the company. The true meaning of the appliance concept eluded the copywriters and promoters: The Mac was a plug-in-and-run machine unlike anything else we've seen, even to this day.

Over the years, the Mac mavens and insiders responsible for the machine left the company. The new Mac cheerleaders were leftover myopic ding-a-lings who loved the Mac but had no concept whatsoever of what made it different from the rest of the desktop computers out there. All they knew was that it was better, somehow. Many of them now actually feel threatened by products such as Windows on the PC. Of course, none of them have ever used Windows. But they know it's a threat because Microsoft and all the writers and observers and newsletter editors say that Windows will bring the graphical user interface (with the disgusting acronym GUI — gooey?) to the PC and that therefore the PC world will have caught up to the Mac.

The corporate Apple muckamucks seem to have bought into this dung. They are looking for a defensive position, having spent the last five years squandering the real sales pitch applicable to the Mac and only to the Mac — ease of installation.

Yes, ease of installation. All you Mac users should go out and buy a PC and see how you do. What you'll discover is that nothing on a PC works. At least nothing remotely complicated. Programs don't install. All kinds of weird files have to be created for a program to run. Most software conflicts with other software. Good luck getting a CD-ROM drive to work. Good luck getting a color image to appear properly on-screen. Good luck having enough memory to even run that fat program you acquired. Do you want to hook up a scanner, bunky? Good luck. No wonder corporate America has embraced the PC clones. It was the only way that the MIS department could ensure its own job security. They figured that none of the bozos in the rest of the office would ever get a PC system working. And who needs to worry about alien hardware? "Looks like we're safe."

I turn over a complete Mac system twice a year — maybe more often. But as a dedicated PC user, I'm always stunned by the way I can unload five boxes of Mac hardware and plug in plugs that plug in only where they belong and flip a switch — and SHAZAM, I'm rolling. I can pop in a SuperMac card and a big monitor, slide a few icons into the System Folder, and I'm in business. I can add that virtual-memory software or a spooler in a jiffy. There is no precedent in the world of the IBM PC clone for this kind of ease of installation. I cringe and have nightmares when I realize that I might have to change systems on the PC half of my desk.

With the Macintosh, it's a piece of cake. It's so easy, it's almost ludicrous. But for some unknown reason, this incredible Mac advantage is lost on Apple's marketing department. They don't get it. They can't figure it out. They don't see it. In fact, I doubt that they even know this is going on, and they probably don't read this column. Hey guys, have you ever heard of research? You should try it sometime. You know, maybe see what the competition is doing. Ask some users. DO SOME WORK! Instead we see "The Power to Be Your Best." A hollow catchphrase dreamed up by an adman.

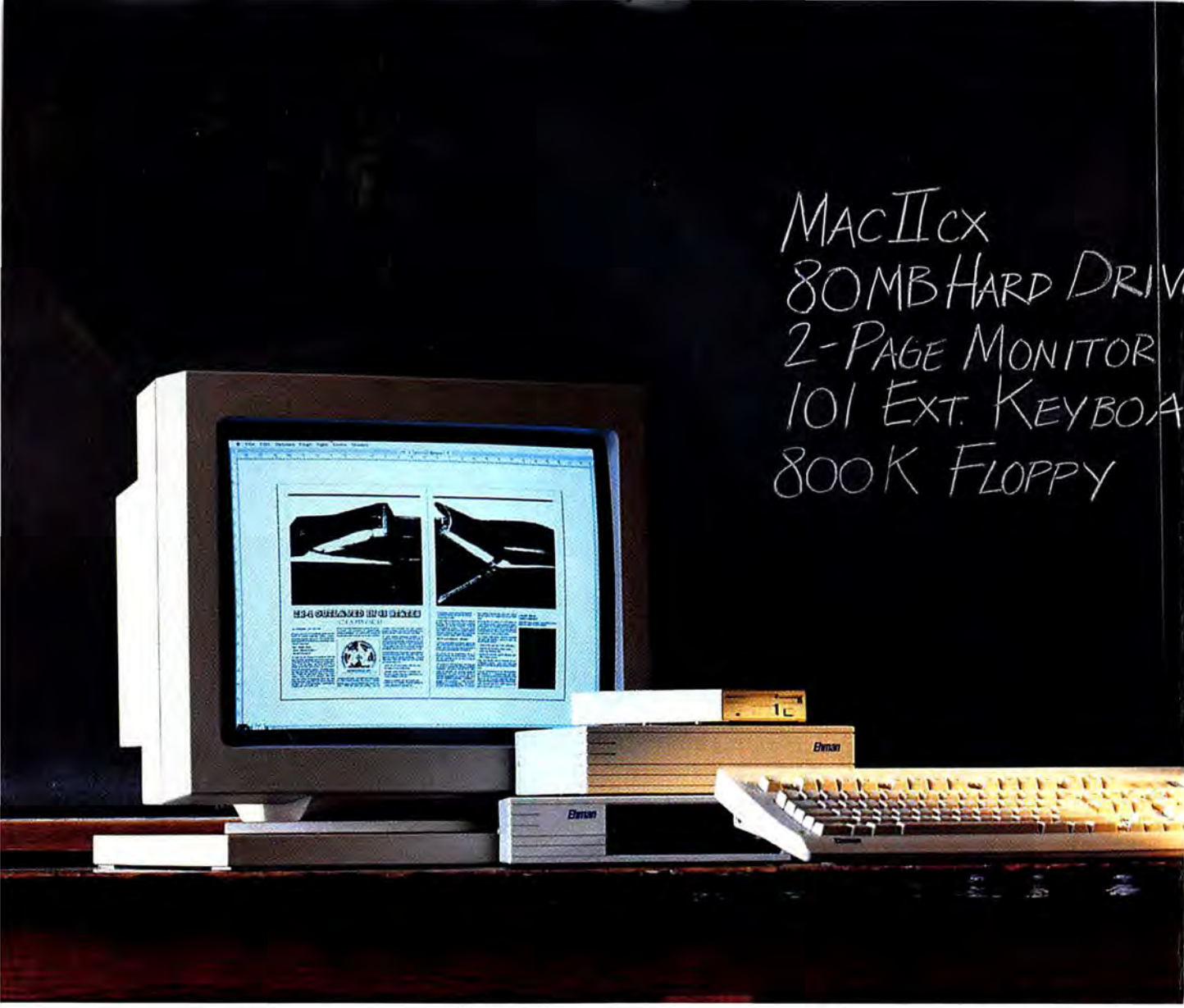
Considering the massive power of a Mac, it's even more amazing that it is so easy to get up and running. There's nothing in the industry that compares to it. Isn't this fact worth mentioning? So why doesn't Apple say something? Its advertising thrust never mentions it. Is it a secret? Is the ad agency unable to communicate the obvious? If so, fire them — before the joke is on us.



BY JOHN C. DVORAK

ILLUSTRATION ROBERT ZIMMERMAN


Ehmanomics
101



The Study of Sup Performance In Mac

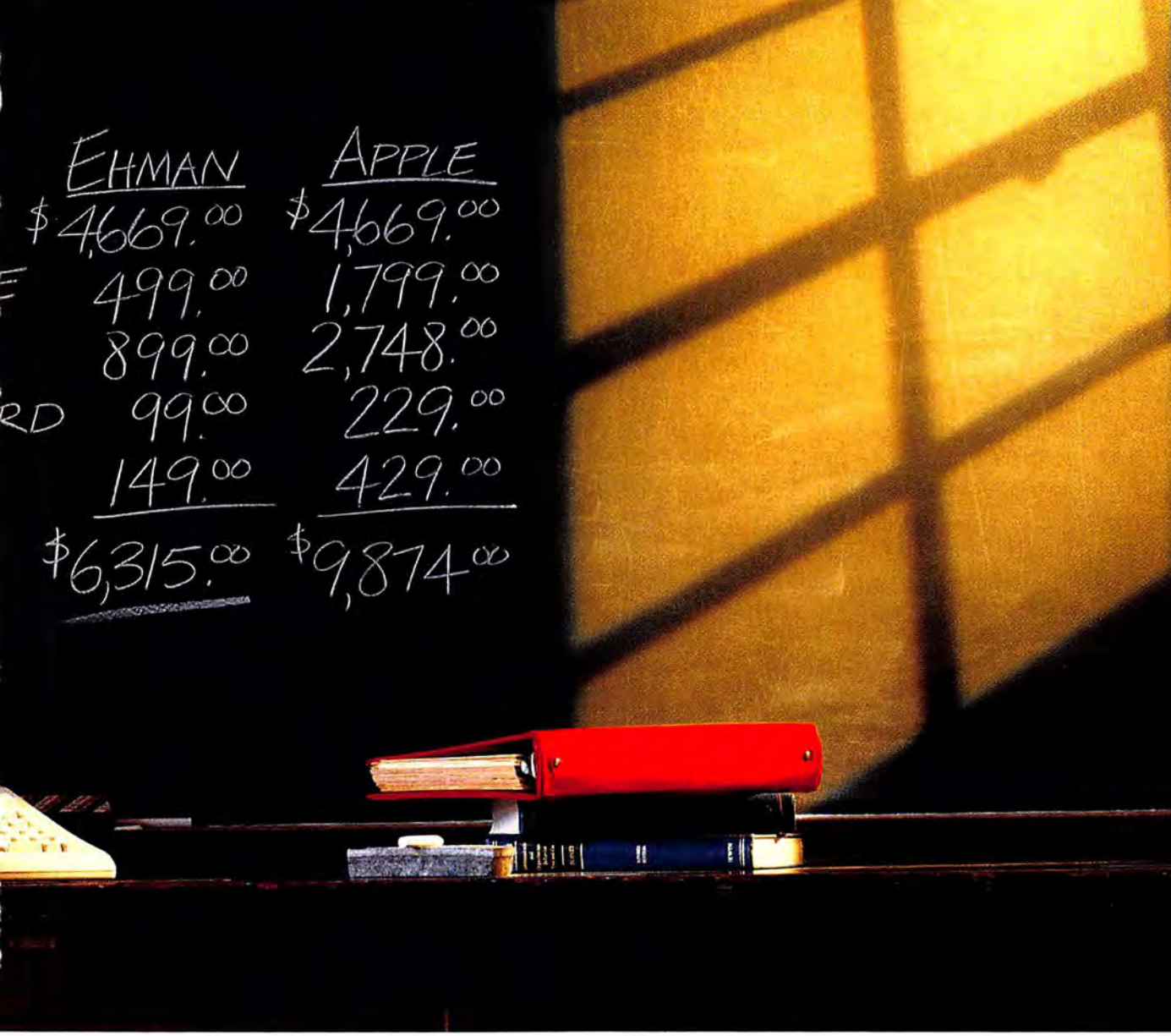
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